Operation

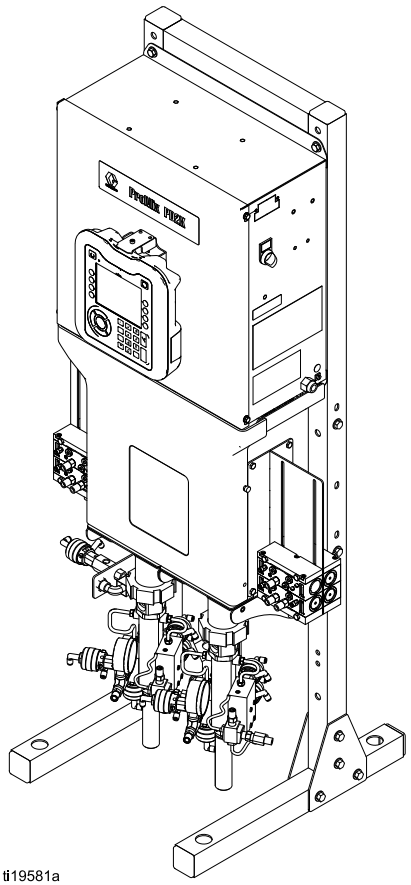
ProMix® PD2K Electronic Proportioner

332562B
EN

Positive displacement proportioning of 2-component materials helps reduce waste. Manual system with Advanced Display Module. For professional use only.

Important Safety Instructions
Read all warnings and instructions in this manual and in your PD2K Installation and Repair/Parts manuals.
Save these instructions.

See page 3 for model part numbers and approvals information.



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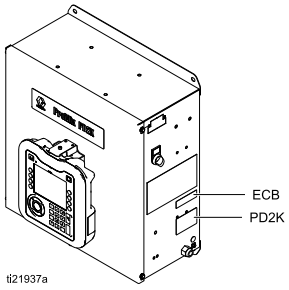
Models

See Figs. 1–7 for component identification labels, including approval information and certification.

Part No.	Series	Maximum Air Working Pressure	Maximum Fluid Working Pressure	Location of PD2K and Electrical Control Box (ECB) Labels
MC0500	A	100 psi (0.7 MPa, 7.0 bar)	With low-pressure pumps: 300 psi (2.068 MPa, 20.68 bar)	
			With high-pressure pumps: 1500 psi (10.34 MPa, 103.4 bar)	
MC1000	A	100 psi (0.7 MPa, 7.0 bar)	300 psi (2.068 MPa, 20.68 bar)	
MC2000	A	100 psi (0.7 MPa, 7.0 bar)	1500 psi (10.34 MPa, 103.4 bar)	

CE 0359 Ex II 2 G FM C US APPROVED

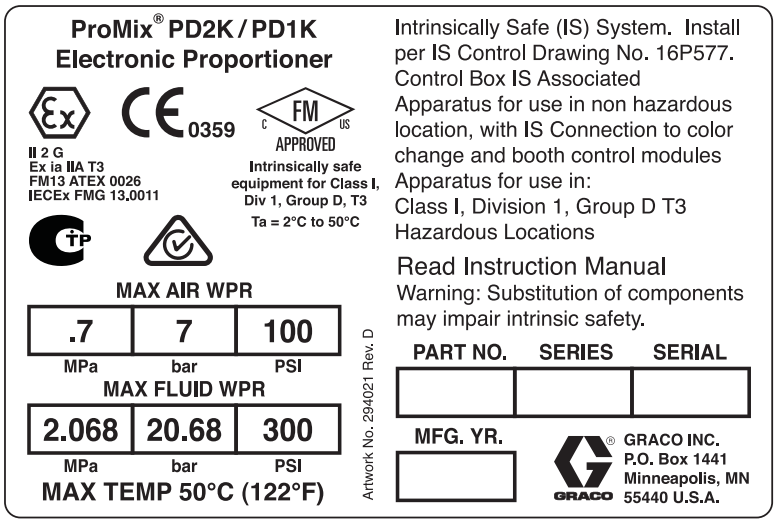

ProMix® PD2K / PD1K
Electronic Proportioner
II 2 G
Ex ia IIA T3
FM13 ATEX 0026
IECEx FMG 13.0011
0359
APPROVED
Intrinsically safe equipment for Class I, Div 1, Group D, T3
Ta = 2°C to 50°C
MAX AIR WPR
.7 7 100
MPa bar PSI
MAX FLUID WPR
2.068 20.68 300
MPa bar PSI
MAX TEMP 50°C (122°F)
Artwork No. 294021 Rev. D
Intrinsically Safe (IS) System. Install per IS Control Drawing No. 16P577. Control Box IS Associated Apparatus for use in non hazardous location, with IS Connection to color change and booth control modules Apparatus for use in: Class I, Division 1, Group D T3 Hazardous Locations
Read Instruction Manual
Warning: Substitution of components may impair intrinsic safety.
PART NO. SERIES SERIAL
MFG. YR.
GRACO INC.
P.O. Box 1441
Minneapolis, MN
55440 U.S.A.

Figure 1 Model MC1000 (Low Pressure) Identification Label

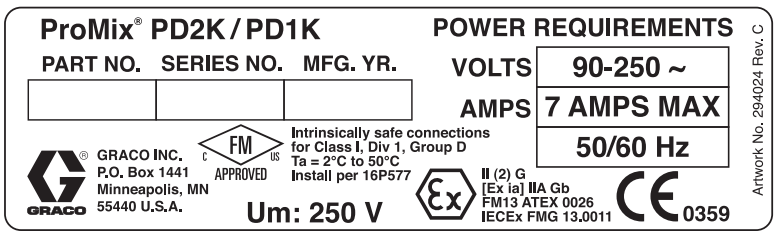


Figure 2 24M672 Control Box Identification Label

Continued on the next page.

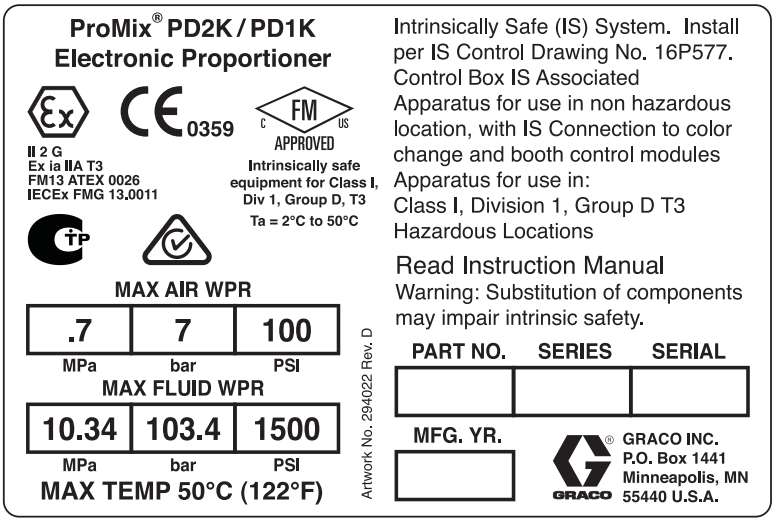


Figure 3 Model MC2000 (High Pressure) Identification Label

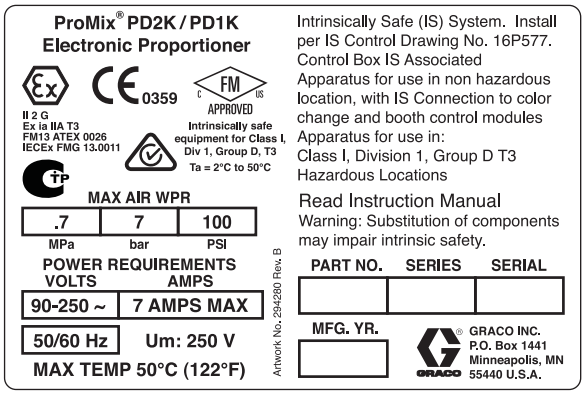


Figure 4 Model MC0500 Identification Label

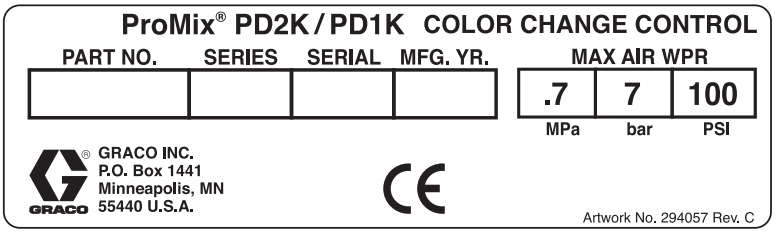


Figure 5 Non-Intrinsically Safe Color Change Control (Accessory) Identification Label

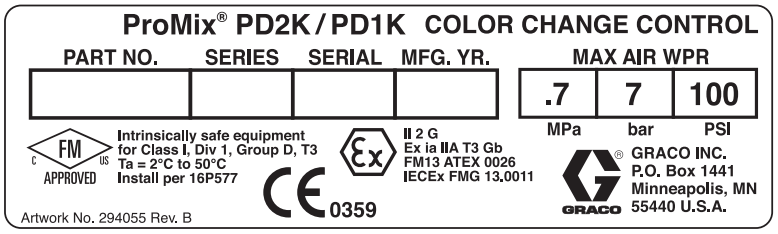


Figure 6 Intrinsically Safe Color Change Control (Accessory) Identification Label

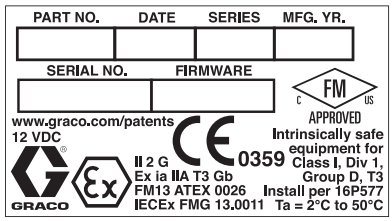


Figure 7 Booth Control Identification Label

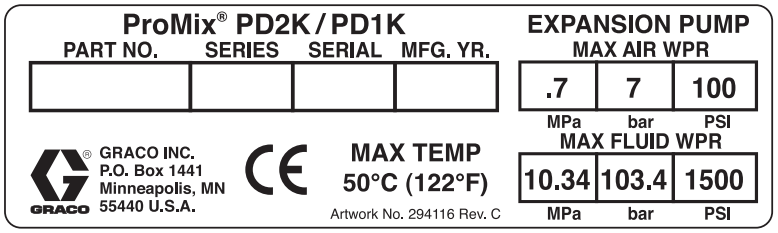


Figure 8 Pump Expansion Kit (Accessory) Identification Label

Related Manuals

Manual No.	Description
3A2800	PD2K Proportioner Repair-Parts Manual, Manual Systems
332457	PD2K Proportioner Installation Manual, Manual Systems
3A2801	Mix Manifold Instructions-Parts Manual
332339	Pump Repair-Parts Manual
332454	Color Change Valve Repair-Parts Manual

Manual No.	Description
332455	Color Change Kits Instructions-Parts Manual
332456	3rd and 4th Pump Kits Instructions-Parts Manual
334512	PD1K Pump Expansion Kits Instructions-Parts Manual

Warnings

The following warnings are for the setup, use, grounding, maintenance and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock, Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

WARNING

INTRINSIC SAFETY

Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements.

- Be sure your installation complies with national, state, and local codes for the installation of electrical apparatus in a Class I, Group D, Division 1 (North America) or Class I, Zones 1 and 2 (Europe) Hazardous Location, including all of the local safety fire codes (for example, NFPA 33, NEC 500 and 516, OSHA 1910.107, etc.).
- To help prevent fire and explosion:
  - Do not install equipment approved only for a non-hazardous location in a hazardous location. See model ID label for the intrinsic safety rating of your model.
  - Do not substitute system components as this may impair intrinsic safety.
- Equipment that comes in contact with the intrinsically safe terminals must be rated for Intrinsic Safety. This includes DC voltage meters, ohmmeters, cables, and connections. Remove the unit from the hazardous area when troubleshooting.

SKIN INJECTION HAZARD

High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not spray without tip guard and trigger guard installed.
- Engage trigger lock when not spraying.
- Do not point gun at anyone or at any part of the body.
- Do not put your hand over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop spraying/dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

WARNING

TOXIC FLUID OR FUMES

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

EQUIPMENT MISUSE HAZARD

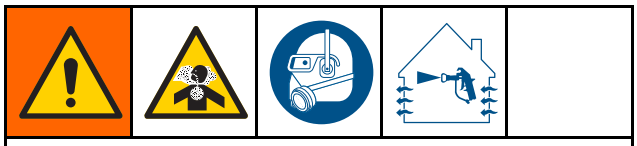
Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Important Isocyanate (ISO) Information

Isocyanates (ISO) are catalysts used in two component materials.

Isocyanate Conditions



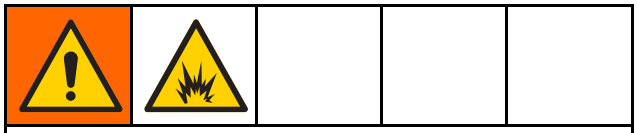
Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.

Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates.

Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area.

To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.

Material Self-ignition



Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and material MSDS.

Keep Components A and B Separate

Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- **Never** interchange component A and component B wetted parts.
- Never use solvent on one side if it has been contaminated from the other side.

Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure; forming small, hard, abrasive crystals, which become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity.

NOTICE

Partially cured ISO will reduce performance and the life of all wetted parts.

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

NOTE: The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

Changing Materials

NOTICE

Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Always clean the fluid inlet strainers after flushing.
- Check with your material manufacturer for chemical compatibility.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the A (resin) side.

Glossary of Terms

Advanced Display Module (ADM) - the user interface for the system. See Advanced Display Module, page 16.

Enhanced Fluid Control Module (EFCM) - the fluid controller for the system.

Grand Total - a non-resettable value that shows the total amount of material dispensed through the system.

Idle - if the gun is not triggered for a user-settable value, the system enters Idle mode. Trigger the gun to resume operation.

Intrinsically Safe (IS) - refers to the ability to locate certain components in a hazardous location.

Job Total - a resettable value that shows the amount of material dispensed through the system for one job. A job is complete when the user presses the Job Complete key on the Booth Control or ADM.

Mix - when cross-linking of the resin (A) and catalyst (B) occurs.

Potlife Time - the amount of time before a material becomes unsprayable.

Potlife Volume - the amount of material that is required to move through the mix manifold, hose, and applicator before the potlife timer is reset.

Pump Calibration Factor - the amount of material dispensed per revolution of the motor.

Purge - when all mixed material is flushed from the mix manifold, hose, and gun.

Purge Time - the amount of time required to flush all mixed material from the gun.

Run Screens - The Run screens provide a graphical depiction of system operation and current status. See Run Mode Screens, page 31.

Setup Screens - The Setup screens allow the user to define the system, setup recipes, and establish system operating parameters. See Setup Mode Screens, page 38.

Standby - refers to the status of the system.

Overview

Usage

This electronic two-component paint proportioner can blend most two-component paints, including quick-setting paints (those with a pot life of 5 minutes and greater).

- The system dispenses Material A, monitors fluid flow, and continually dispenses Material B at ratio.
- Can proportion at ratios from 0.1:1 to 50.0:1 (depending on material, flow rate, pump size selection, and mix point).
- Will display the last 200 jobs, 200 errors, and 200 events with date, time, and description.

Component Identification and Definition

Component	Description
Electrical Control Box	• Enhanced Fluid Control Module (EFCM) • 24 V Power Supply for the barrier board and the EFCM • 48 V Power Supply for pump motors • Solenoid Valves for solvent valve and gun flush box (if present) • Air Flow Switch • Relay • Optional Pressure Switch for gun flush box (if present) • Pump Control Modules (2), one for each pump • CAN Isolation Board • Intrinsically Safe Power Barrier Board
Fluid Components	• Mix manifold (accessory), which can be attached to the operator's belt. • Color/catalyst valve stacks, including pneumatically operated valves for Material A and B, as well as solvent valves. • Solvent Flow Switch • Pumps • Pressure transducers
Advanced Display Module	Use to set up, display, operate, and monitor the system. Use for daily painting functions including choosing recipes, reading/clearing errors, and placing the system in Spray, Standby, or Purge mode. Locate in the non-hazardous area.
Booth Control	Use for daily painting functions including choosing recipes, reading/clearing errors, and placing the system in Spray, Standby, or Purge mode. Locate in the hazardous area.

Typical Installation (MC1000, MC2000)	
HAZARDOUS (CLASSIFIED) LOCATION	NON-HAZARDOUS LOCATION ONLY

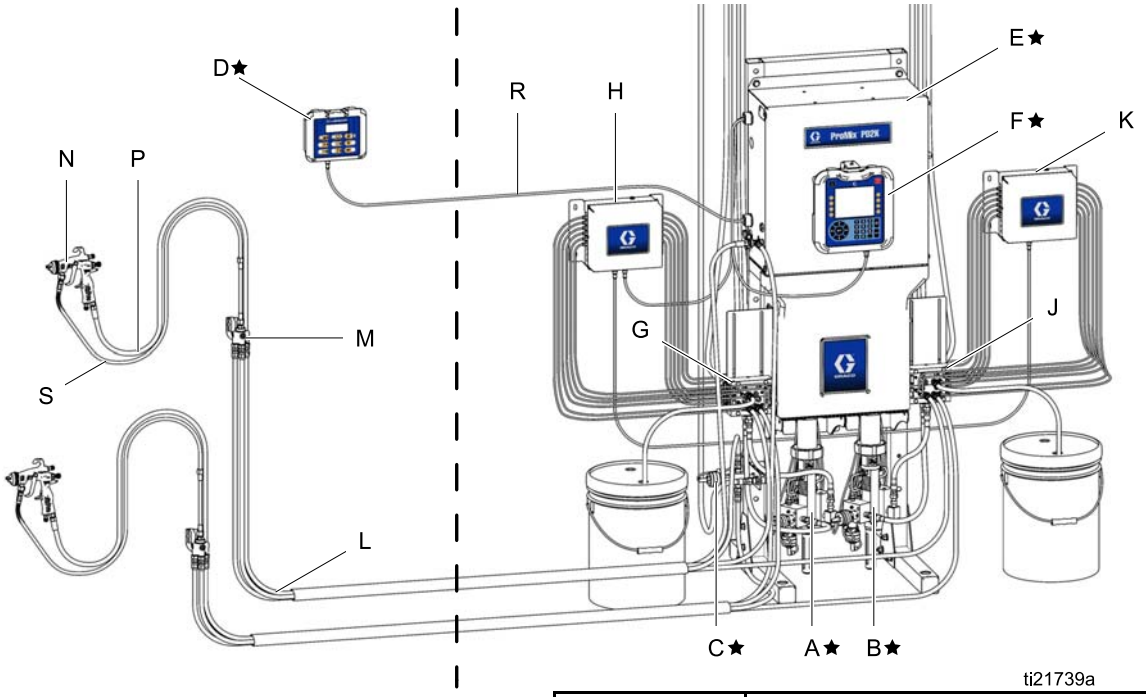


Figure 9

Component	Description
★ Components A through F are included with the base unit.	
A★	Material A (Color) Pump
B★	Material B (Catalyst) Pump
C★	Solvent Valve
D★	Booth Control
E★	Electrical Control Box
F★	Advanced Display Module

Component	Description
Components G through K are included in optional color change kits.	
G	Color Change Valves (accessory)
H	Color Change Module (accessory)
J	Catalyst Change Valves (accessory)
K	Catalyst Change Module (accessory)
Components L through S are accessories and must be ordered separately.	
L	Fluid/Air hose Bundle (accessory)
M	Mix Manifold (accessory)
N	Air Spray Gun (accessory)
P	Gun Air Hose (accessory)
R	Intrinsically Safe CAN Cable (to connect booth control to electrical control box)
S	Gun Fluid Hose (accessory)

Typical Installation (MC0500)	
HAZARDOUS (CLASSIFIED) LOCATION	NON-HAZARDOUS LOCATION ONLY

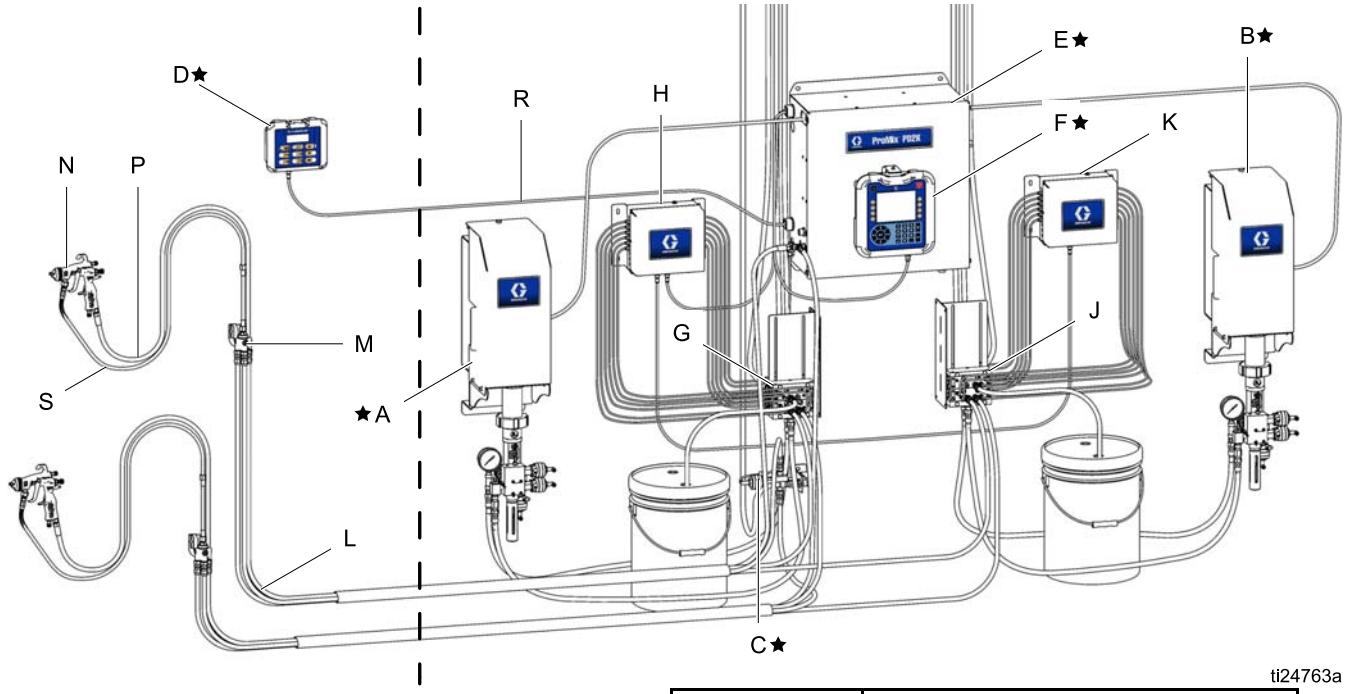


Figure 10

Component	Description
★ Components D, E, and F are included with the base unit.	
D★	Booth Control
E★	Electrical Control Box
F★	Advanced Display Module

Component	Description
★ Pumps A and B are required but are sold separately for system design flexibility.	
A★	Material A (Color) Pump
B★	Material B (Catalyst) Pump

Component	Description
Components G through K are included in optional color change kits.	
G	Color Change Valves (accessory)
H	Color Change Module (accessory)
J	Catalyst Change Valves (accessory)
K	Catalyst Change Module (accessory)
Components L through S are accessories and must be ordered separately.	
L	Fluid/Air hose Bundle (accessory)
M	Mix Manifold (accessory)
N	Air Spray Gun (accessory)
P	Gun Air Hose (accessory)
R	Intrinsically Safe CAN Cable (to connect booth control to electrical control box)
S	Gun Fluid Hose (accessory)

Advanced Display Module

ADM Display

The ADM display shows graphical and text information related to setup and spray operations.

For detail on the display and individual screens, see Run Mode Screens, page 31, or Setup Mode Screens, page 38.

Keys are used to input numerical data, enter setup screens, navigate within a screen, scroll through screens, and select setup values.

NOTICE

To prevent damage to the softkey buttons, do not press the buttons with sharp objects such as pens, plastic cards, or fingernails.

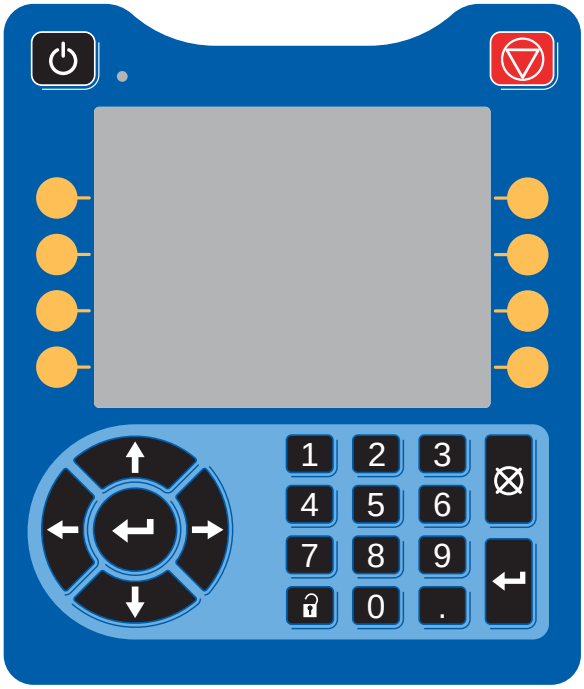


Figure 11 Advanced Display Module

USB Download Procedure

Use the USB port on the ADM to download or upload data.

1. Enable USB downloads. See Advanced Screen 3, page 56.
2. Remove the cover from the USB port on the bottom of the ADM. Insert the USB drive.
3. During the download, USB BUSY appears on the screen.
4. When the download is complete, USB IDLE appears on the screen. The USB drive may then be removed.

   NOTE: If the download operation takes longer than 60 seconds, the message disappears. To determine if the USB is busy or idle, check the Error Status bar on the screen. If idle, remove the USB.
5. Insert the USB flash drive into the USB port of the computer.
6. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows® Explorer.
7. Open Graco folder.
8. Open system folder. If downloading data from more than one system, there will be more than one folder. Each folder is labeled with the corresponding serial number of the ADM. (The serial number is on the back of the ADM.)
9. Open DOWNLOAD folder.
10. Open LOG FILES folder labeled with the highest number. The highest number indicates the most recent data download.
11. Open log file. Log files open in Microsoft® Excel® by default if the program is installed. They also can be opened in any text editor of Microsoft® Word.

    NOTE: All USB logs are saved in Unicode (UTF-16) format. If opening the log file in Microsoft Word, select Unicode encoding.
12. Always reinstall the USB cover after removing the USB, to keep the drive free of dirt and dust.

USB Upload Procedure

Use this procedure to install a system configuration file and/or a custom language file.

1. If necessary, follow the **USB Download Procedure,** to automatically generate the proper folder structure on the USB flash drive.
2. Insert the USB flash drive into the USB port of the computer.
3. The USB flash drive window automatically opens. If it does not, open the USB flash drive from within Windows Explorer.
4. Open the Graco folder.
5. Open the system folder. If working with more than one system, there will be more than one folder within the Graco folder. Each folder is labeled with the corresponding serial number of the ADM. (The serial number is on the back of the module.)
6. If installing the system configuration settings file, place SETTINGS.TXT file into UPLOAD folder.
7. If installing the custom language file, place DISPTEXT.TXT file into UPLOAD folder.
8. Remove the USB flash drive from the computer.
9. Install the USB flash drive into the USB port of the ProMix PD2K system USB port.
10. During the upload, USB BUSY displays on the screen.
11. Remove the USB flash drive from the USB port.

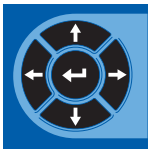
NOTE: If the custom language file was installed, users can now select the new language from the Language drop-down menu in the Advanced Setup Screen 1.

ADM Keys and Indicators

NOTICE

To prevent damage to the softkey buttons, do not press the buttons with sharp objects such as pens, plastic cards, or fingernails.

Table 1 : ADM Keys and Indicators

Key	Function
Startup/Shutdown Key and Indicator	Press to startup or shutdown the pump/motor. • Solid green indicates that power is applied to the motor. • Solid yellow indicates that power to the motor is off. • Blinking green or yellow indicates that the system is in Setup mode.
Stop	Press to immediately stop the system and remove motor power.
Soft Keys	Press to select the specific screen or operation shown on the display directly next to each key. The top left soft key is the Edit key, which allows access to any settable fields on a screen.
 Navigation Keys	• *Left/Right Arrows:* Use to move from screen to screen. • *Up/Down Arrows:* Use to move among fields on a screen, items on a dropdown menu, or multiple screens within a function.
Numeric Keypad	Use to input values. See ADM Display, page 16.
Cancel	Use to cancel a data entry field.
Setup	Press to enter or exit Setup mode.
Enter	Press to choose a field to update, to make a selection, to save a selection or value, to enter a screen, or to acknowledge an event.

Soft Key Icons

The following icons appear in the ADM display, directly to the left or right of the soft key which activates that operation.

NOTICE

To prevent damage to the softkey buttons, do not press the buttons with sharp objects such as pens, plastic cards, or fingernails.

Table 2 : Soft Key Functions

Key	Function
Enter Screen	Press to enter screen for editing. Highlights editable data on a screen. Use Up/Down arrows to move between data fields on the screen.
Exit Screen	Press to exit screen after editing.
Accept	Press to accept calibration value.
Cancel	Press to cancel or reject calibration value.
Prime Pump	Press to start a pump priming procedure.
Line/Fill/Run	Press to start a line fill procedure.
Mix	Press to start a spray procedure.
Purge	Press to start a gun purge procedure.

Key	Function
 Standby	Press to stop all pumps and put system in Standby.
 Stop	
 Pressure Check	Press to start a pump pressure check.
 Volume Check	Press to start a pump volume check.
 Job Complete	Press to log the material usage and increment the job number.
 Counter Reset	Press to reset the current usage counter.
 Move Cursor to Left	Appears on the User ID Keyboard screen. Use to move cursor to the left.
 Move Cursor to Right	Appears on the User ID Keyboard screen. Use to move cursor to the right.
 Erase All	Appears on the User ID Keyboard screen. Use to erase all characters.
 Backspace	Appears on the User ID Keyboard screen. Use to erase one character at a time.
 Upper Case/Lower Case	Appears on the User ID Keyboard screen. Use to change case (upper/lower).

Navigating the Screens

There are two sets of screens:

- The Run screens control mixing operations and display system status and data.
- The Setup screens control system parameters and advanced features.

Press on any Run screen to enter the Setup screens. If the system has a password lock, the Password screen displays. If the system is not locked (password is set to 0000), System Screen 1 displays.

Press on any Setup screen to return to the Home screen.

Press the Enter soft key to activate the editing function on any screen.

Press the Exit soft key to exit any screen.

Use the other softkeys to select the function adjacent to them.

Screen Icons

As you move through the screens, you will notice that icons are used frequently to simplify global communication. The following descriptions explain what each icon represents.

Screen Icons	
User ID	Job Number
Potlife	Target Ratio
Recipe Number	Flow Rate
Pressure	Volume
Material A	Material B
Material A+B	Solvent
Calendar	Time
Alarm/Advisory	Deviation

Booth Control

Booth Control Display

The booth control is the main control device used by the operator for daily painting functions including: changing recipes, signaling job complete, reading/clearing alarms, and placing the system in Standby, Mix, or Purge mode. It is typically mounted inside the booth or near the painter.

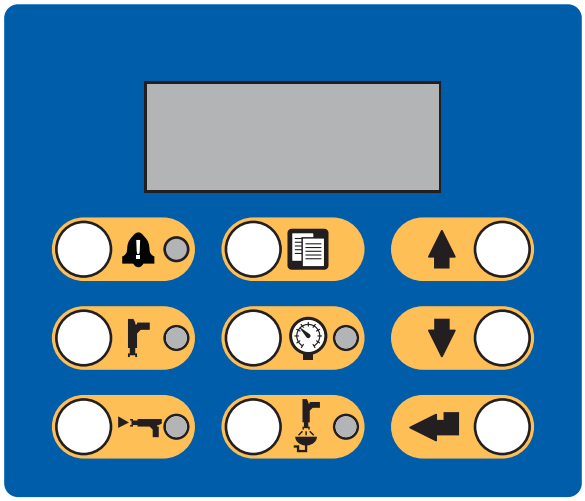


Figure 12 Booth Control

The booth control displays the recipe in the following formats:

- R-xx (active recipe)
- P-xx (recipe loaded in the pumps)
- G-xx (recipe loaded in the gun)

The booth control display circulates through the recipe and error status:

- Displays the recipe number (R-xx) when ready to spray (the pumps and gun are loaded with the same recipe). If the display is on steady and does not show recipe 0 or 61, the system is ready to spray. (Recipe 61 indicates an unknown material.)
- If the gun is loaded with one recipe (G-xx) and the pumps with another (P-xx), the display will alternate between the two recipes.
- If an alarm occurs, the alarm code is displayed and the red Alarm indicator will flash until acknowledged. After the alarm is acknowledged, the LED will be on steady and the recipe number will alternate with the code.

Press and hold the Standby key for 2 seconds to turn the pumps on or off.

To select a new recipe, scroll Up or Down to the desired recipe, then press Enter. If Enter is not pressed within 5 seconds, the system will revert to the existing recipe.

Booth Control Keys and Indicators

Key/Indicator	Definition and Function
Alarm Reset Key and Indicator	• Red LED is solid when an alarm condition is present. • Red LED blinks when an event requiring user acknowledgement occurs at any level. • Press key to acknowledge. LED shuts off after alarm is cleared.
Standby Mode Key and Indicator	• Starts Standby mode. • Green LED remains lit while in Standby mode. • Green LED blinks when the system is on and is not mixing or purging. In Idle mode, the Standby LED and the Mix LED both blink. • Green LED blinks during pump maintenance checks. • Press and hold the key to startup or shutdown the pumps.
Mix Mode Key and Indicator	• Starts Mix mode. • Green LED remains lit while in Mix mode. • Green LED blinks during a mix fill. If there is no fluid flow for 30 sec after starting mix fill, the process must be restarted. • In Idle mode, the Mix LED and the Standby LED both blink.
Job Complete Key	• Signals that job is complete, and resets A, B, and solvent totalizers. • Press to display the current job number on the booth control. Press a second time to log the current job and increment to the next job number. Times out after 5 seconds of inactivity.
Pressure Control Key and Indicator	• Starts Pressure Change mode. • Green LED blinks while in Pressure Change mode. • To change the pressure, press the Pressure Control key and use the Up/Down keys to select the desired pressure. Pressure Change mode times out after 5 seconds of inactivity. Stored recipe is only updated at the end of a spray mode.
Purge Mode Key and Indicator	• Starts Purge mode. • Green LED remains lit while in Purge mode. • Green LED blinks when gun needs to be purged and is waiting for purge to begin.
Up Key	• Scrolls recipe numbers up. • Scrolls pressure value up in Pressure Change mode.
Down Key	• Scrolls recipe numbers down. • Scrolls pressure value down in Pressure Change mode.
Enter Key	• Enters selected recipe and starts color change sequence. • Accepts pressure value change.

Operation

Pre-operation Checklist

Go through the Pre-Operation Checklist daily, before each use.

✓	Checklist
	System grounded Verify all grounding connections were made. See **Grounding** in the Installation manual.
	All connections tight and correct Verify all electrical, fluid, air, and system connections are tight and installed according to the Installation manual.
	Fluid supply containers filled Check component A and B and solvent supply containers.
	Dose valves set Check that dose valves are set 1–1/4 turns open. Start with the settings recommended in Valve Settings, page 30, then adjust as needed.
	Fluid supply valves open and pressure set The recommended component A and B fluid supply pressures are 1/2 to 2/3 of the target spray pressure. **NOTE:** Low pressure systems may be set within a range of ± 100 psi (0.7 MPa, 7 bar); high pressure systems may be set within a range of ± 300 psi (2.1 MPa, 21 bar). If the inlet pressure is higher than the outlet pressure, ratio accuracy may be affected.
	Solenoid pressure set 85-100 psi inlet air supply (0.6-0.7 MPa, 6-7 bar).

Flush Before Using Equipment

The pump fluid section was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment.

Power On

1. Turn the AC Power Switch ON (I = ON, 0 = OFF).
2. The Graco logo will display while the system initializes, followed by the Home screen.
3. Press the Start key . The system status will change from “System Off” to “Startup.” Once the pumps are powered and are in the Home position, the system status will change from “Startup” to “Standby.”

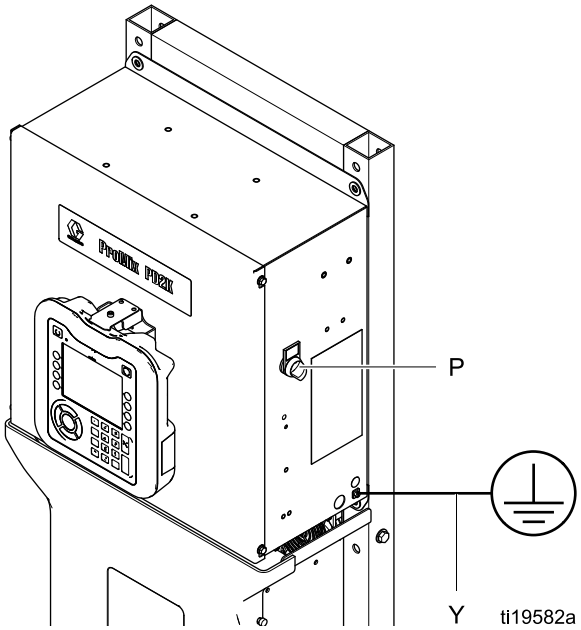


Figure 13 Power Switch

Initial System Setup

1. Change optional setup selections to desired parameters, as described in Setup Mode Screens, page 38.
2. Set recipe and flush information as described in Recipe Screen, page 45 and Flush Screen, page 47.

Prime and Fill the System

NOTE: See Run Mode Screens, page 31, for further screen information, if needed.

NOTE: Be sure the mix manifold is set to the SPRAY position.

NOTE: You must prime the input lines to the pumps or the inputs to the color change valves before priming the pump and filling the entire system.

1. If using an electrostatic gun, shut off the electrostatics before filling the lines.
2. Adjust the main air pressure. To ensure proper operation, set the main air pressure as close to 100 psi (0.7 MPa, 7.0 bar) as possible. Do not use less than 85 psi (0.6 MPa, 6.0 bar).
3. If this is the first time starting up the system, or if lines may contain air, purge as instructed under Purging, page 27. The equipment was tested with lightweight oil, which should be flushed out to avoid contaminating your material.
4. **If the system is powered down,** press on the ADM. Make sure that the system is in Standby mode.
5. Verify that the recipes and the flush sequences are programmed correctly by checking the Recipe Screen, page 45 and the Flush Screen, page 47.
6. Go to the Fill Screen, page 35.
7. Select the desired color to load. Press the Prime Pump key . The color will load the pump through the color stack and out the outlet stack dump valve.

   NOTE: In a single color system, skip step 7 and prime the pump out to the gun.
8. Press the Fill Line key to run color out to the mix manifold. The pump will run until you press the Stop key to stop the pump.
9. Trigger the gun into a grounded metal pail until the line is full, then press the Stop key .
10. Repeat for all material lines.

Spraying

To spray in a multiple color system, also see Multiple Color Systems, page 60.

NOTE: See Run Mode Screens, page 31, for further screen information, if needed.

1. Set the desired mix manifold to the SPRAY position.
2. Press Mix . The system will load the correct mixed material volume. The Mix Mode LED and the recipe display on the booth control will blink during the mix fill. If the gun is loaded with one recipe (G-xx) and the pumps with another (P-xx), the display will alternate between the two recipes. When the mix fill is completed, the display will show R-xx, and the system will go into Standby Mode.

   NOTE: The system will automatically run a Mix Fill if the recipe is not currently loaded into the system. The Mix Fill volume calculation includes the mix manifold volume and the mixed material hose volume. The mixed material hose volume is determined by the gun hose length and diameter entered in System Screen 2, page 40.
3. Press Mix again. The Mix Mode LED will turn on solid to indicate the system is mixing. Adjust the flow rate by changing the target pressure. The fluid flow rate shown on the Spray screen is the combined total of component A and B out of the gun.
   - **If the fluid flow rate is too low:** increase the spray pressure setting on the Spray screen or booth control.
   - **If the fluid flow rate is too high:** decrease the spray pressure setting on the Spray screen or booth control.

   NOTE: If spray pressure is adjusted at the ADM or booth control while spraying, it is not saved in the recipe until the system is put in Standby. This changes the pressure in the desired recipe.
4. Turn on atomizing air to the gun. Check the spray pattern as instructed in your spray gun manual.

NOTE: Do not use the first 4-5 oz. (120-150 cc) of material as it may not be thoroughly mixed due to errors while priming the system. The Spray LED must be on.

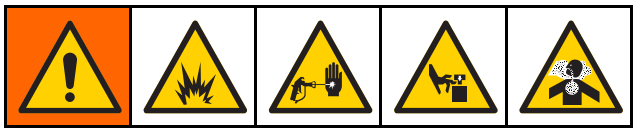
NOTICE

Do not allow a fluid supply tank to run empty. This can damage the pumps and lead to the proportioning of fluid and air that meets the ratio and tolerance settings of the equipment. This can further result in spraying uncatalyzed or poorly catalyzed material.

Purging

To purge one color and fill with a new color, see Color Change, page 60.

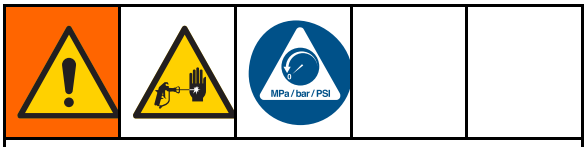
Flush Mixed Material



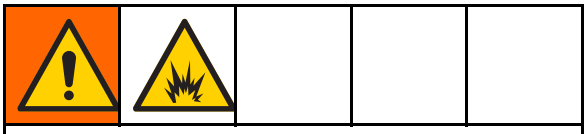
There are times when you only want to purge the mix manifold and gun, such as:

- end of potlife
- breaks in spraying that exceed the potlife
- overnight shutdown or end of shift
- before servicing the mix manifold, hose or gun.

1. Press Standby .
2. If you are using a high pressure gun or an electrostatic gun, shut off the atomizing air.



If you are using a high pressure gun, engage the trigger lock. Remove the spray tip and clean it separately.



If using an electrostatic gun, shut off the electrostatics before flushing the gun.

3. Trigger the gun to relieve pressure.
4. Set the solvent supply pressure regulator at the lowest pressure possible, to avoid splashing or an injection injury. Generally a setting of 25–50 psi (0.18–0.35 MPa, 1.8–3.5 bar) is sufficient.
5. Set the mix manifold to the FLUSH position.
6. Press Purge . Trigger the gun into a grounded metal pail until the purge sequence is complete. When done purging, the system automatically switches to Standby mode, signalling the user to release the trigger.
7. If the system is not completely clean, repeat.

   NOTE: For optimal efficiency, adjust purge sequence times so only one cycle is required.
8. Trigger the gun to relieve pressure. Engage the trigger lock.
9. If the spray tip was removed, reinstall it.
10. Adjust the solvent supply regulator back to its normal operating pressure.

NOTE: The mix manifold and gun remain full of solvent after purging.

Flush the System

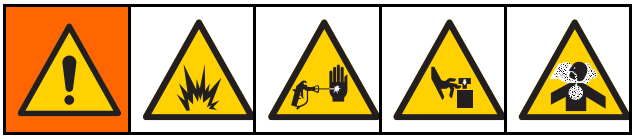
Follow this procedure before:

- the first time material is loaded into the equipment
- servicing
- shutting down equipment for an extended period of time
- putting equipment into storage

Single Color System

1. Relieve the pressure. See Pressure Relief Procedure, page 29.
2. Disconnect the color and catalyst supply lines from the pump inlet manifolds, and connect regulated solvent supply lines.
3. Set the solvent supply pressure regulator at the lowest pressure possible, to avoid splashing or an injection injury. Generally a setting of 25–50 psi (0.18–0.35 MPa, 1.8–3.5 bar) is sufficient.
4. Set the mix manifold to the SPRAY position.
5. On the ADM, go to the Fill screen. Set the Material to Color (A). Press . The system will pump solvent through pump A all the way to the gun.
6. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until clean solvent dispenses.
7. On the ADM, go to the Fill screen. Set the Material to Catalyst (B). Press . The system will pump solvent through pump B all the way to the gun.
8. Relieve the pressure. See Pressure Relief Procedure, page 29

Color Change System



1. Relieve the pressure. See Pressure Relief Procedure, page 29.
2. Attach regulated solvent supply lines as follows:
   - **Multiple color/single catalyst system:** On the color side, do not disconnect the color supply line from the inlet manifold of Pump A. Instead, connect a regulated solvent supply line to the designated solvent valve on the color valve manifold. On the catalyst side, disconnect the catalyst supply line from the inlet manifold of Pump B, and connect a regulated solvent supply line.
   - **Multiple color/multiple catalyst system:** Connect regulated solvent supply lines to the designated solvent valves on the color and catalyst valve manifolds. Do not connect solvent supply lines directly to the inlet manifolds of the pumps.
3. Set the solvent supply pressure regulator at the lowest pressure possible, to avoid splashing or an injection injury. Generally a setting of 25–50 psi (0.18–0.35 MPa, 1.8–3.5 bar) is sufficient.
4. Set the mix manifold to the SPRAY position.
5. On the ADM, go to the Fill screen. Select Color (A). Enter the color number in the box to the right.
6. Select the Flush Line box.
7. If the solvent is not already loaded, press the Prime softkey . The system will prime solvent into the selected pump and out the outlet dump valve.
8. Press the Fill softkey . The system will flush the selected Color (A) line with solvent until the user presses Stop .
9. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until clean solvent dispenses.
10. Repeat for each color line.
11. Relieve the pressure. See Pressure Relief Procedure, page 29.

Pressure Relief Procedure

Follow the **Pressure Relief Procedure** whenever you see this symbol.

This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, or servicing the equipment.

Without Color Change

NOTE: The following procedure relieves all fluid and air pressure in the system.

1. Turn off the supply pumps. Open the drain valve on the supply line fluid filter to relieve pressure in the supply line.

   NOTE: If your system does not include a drain valve on the supply line, set the mix manifold to SPRAY and press . Cycle the A and B dosing pumps a couple of times to drain the pumps.

2. Press Standby . Trigger the gun to relieve pressure.
3. Set the mix manifold to FLUSH. Flush the mix manifold and gun. See Flush Mixed Material, page 27.
4. Shut off the solvent supply pump. To relieve pressure, press Purge and trigger the gun. Press Standby when pressure is relieved, to avoid getting a Purge Incomplete alarm.

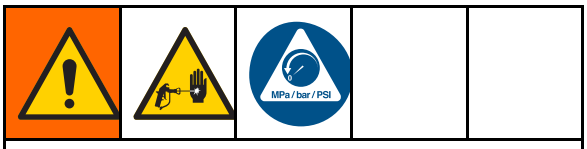
NOTE: If pressure remains in the solvent line between the solvent supply pump and the solvent valve, VERY SLOWLY loosen a fitting to relieve pressure gradually.

With Color Change

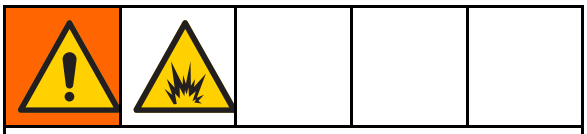
NOTE: The following procedure relieves all fluid and air pressure in the system.

1. Turn off the supply pumps. Open the drain valve on the supply line fluid filter to relieve pressure in the supply lines. Do this for each color.

   NOTE: If your system does not include a drain valve on the supply line, set the mix manifold to SPRAY and press . Cycle the A and B dosing pumps a couple of times to drain the pumps. Repeat for each color.



If you are using a high pressure gun, engage the trigger lock. Remove the spray tip and clean it separately.



If using an electrostatic gun, shut off the electrostatics before flushing the gun.

2. Set the mix manifold to SPRAY. Trigger the gun to relieve pressure. Repeat for each color.
3. Press Purge . Repeat for each color. Hold the gun trigger open after the solvent valve shuts off to relieve all pressure.
4. Set the system to Recipe 0 to flush the system from the pumps to the gun. When flushing is complete the system will go to Standby.
5. Shut off the solvent supply pump. To relieve pressure, press Purge and trigger the gun. Press Standby when pressure is relieved, to avoid getting a Purge Incomplete alarm.

NOTE: If pressure remains in the solvent line between the solvent supply pump and the solvent valve, VERY SLOWLY loosen a fitting to relieve pressure gradually.

Valve Settings

Dose valves and purge valves are factory set with the hex nut (E) 1-1/4 turns out from fully closed.

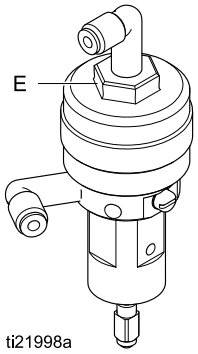


Figure 14 Valve Adjustment

Shutdown

1. Flush out the mixed material to avoid potlife errors and fluid setup in the lines. See Purging, page 27.
2. Follow the Pressure Relief Procedure, page 29.
3. Close the main air shutoff valve on the air supply line and on the control box.
4. Press on the Display Module to turn off power to the pumps.
5. Shut off system power (0 position).

Run Mode Screens

NOTE: Selection fields and buttons that are grayed-out on the screens are not currently active.

Splash Screen

At power up, the Graco logo will display for approximately 5 seconds, followed by the Home screen.

Figure 15 Splash Screen

Home Screen

The Home screen displays the current status of the system. The following table details the information shown.

To view pump flow rates and pressures (as shown), select “Diagnostic Mode” on System Screen 1, page 39.

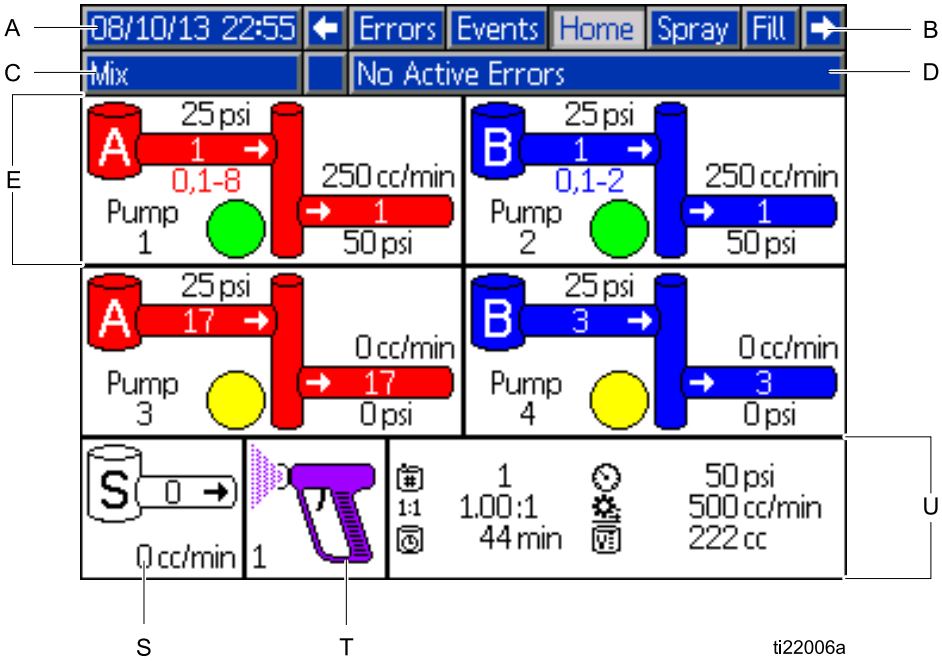
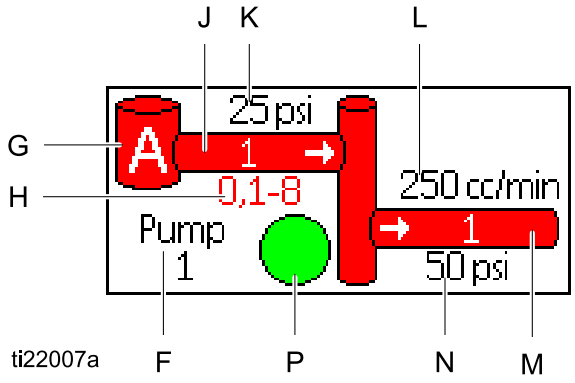
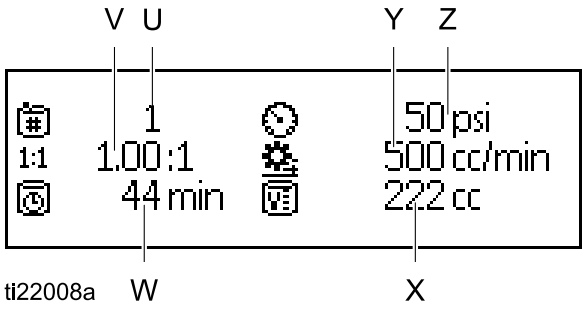


Figure 16 Home Screen, in Mix Mode with Diagnostics On

Home Screen Key

Key	Description	Details	
A	Date and Time	See Advanced Screen 1, page 55, to set.	
B	Menu Bar	Run Screens. Use left and right arrow keys to scroll through the different Run screens: • Home (shown in Diagnostic Mode) • Spray (see Spray Screen, page 34) • Fill (see Fill Screen, page 35) • Potlife (present only when “Multiple Guns is selected on System Screen 3, page 42. See also Information for Systems with Multiple Guns, page 43. • Usage (see Usage Screen, page 36) • Jobs (see Jobs Screen, page 37) • Errors (see Errors Screen, page 37) • Events (see Events Screen, page 37)	
C	Status Bar	System Status: Displays the current mode of operation:	
		• Pump Off • Standby • Startup • Mix • Fill • Purge • Shutdown	• Change Recipe • Idle • Prime Pump • Calibrate • Stall Test • Maintenance Test
D	Error Status	Displays any active error code.	

<table>
<tr><th>Key</th><th>Description</th><th>Details</th></tr>
<tr><td>E</td><td>Pump Animation and Diagnostic Information</td><td rowspan="10"> 
</td></tr>
<tr><td>F</td><td>Pump Number (1–4)</td></tr>
<tr><td>G</td><td>Material (A or B)</td></tr>
<tr><td>H</td><td>Available Colors</td></tr>
<tr><td>J</td><td>Pump Inlet Color</td></tr>
<tr><td>K</td><td>Pump Inlet Pressure</td></tr>
<tr><td>L</td><td>Pump Flow Rate</td></tr>
<tr><td>M</td><td>Pump Outlet Color</td></tr>
<tr><td>N</td><td>Pump Outlet Pressure</td></tr>
<tr><td>P</td><td>Pump Indicator Light
• Clear = power off
• Yellow = standby
• Green = active</td></tr>
<tr><td>S</td><td>Solvent Flow Rate</td><td>Shows solvent flow rate, if a solvent meter is attached.</td></tr>
<tr><td>T</td><td>Gun Animation</td><td>Shows mixed material in gun and displays active recipe at gun. Gun animation changes to show:
• 1 (Mix Fill)
• 1 (Mix With Air Flow)
• 1 (Recipe Standby)
• 1 (Purge)
• 1 (Gun Purge in GFB)
• 0 (Purged Gun in Standby, in GFB)
• 0 (Solvent Standby)
• 1 (Mix With No Air Flow)</td></tr>
<tr><td>U</td><td>Active Recipe</td><td rowspan="6"> 
</td></tr>
<tr><td>V</td><td>Current Ratio (1:1)</td></tr>
<tr><td>W</td><td>Potlife Time Remaining</td></tr>
<tr><td>X</td><td>Total Volume for the Current Job</td></tr>
<tr><td>Y</td><td>Current Flow Rate</td></tr>
<tr><td>Z</td><td>Current Pressure</td></tr>
</table>

Spray Screen

The Spray screen displays the following information:

- Active Recipe (can be changed on this screen)
- Target Ratio
- Actual Ratio
- Target Pressure (can be changed on this screen)
- Actual Pressure
- Actual Flow
- Potlife Remaining
- Gun Animation

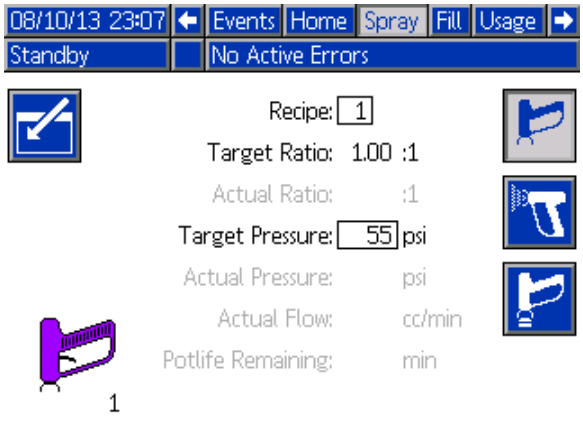


Figure 17 Spray Screen, in Standby Mode

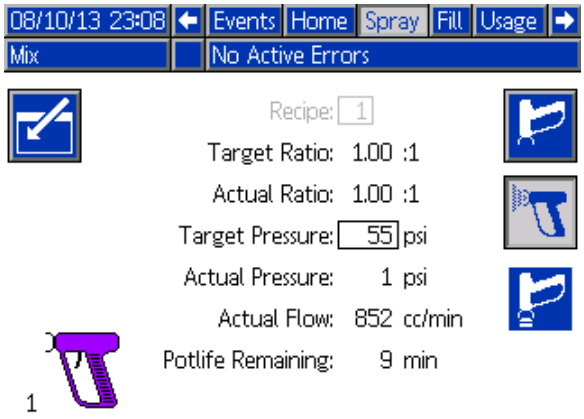


Figure 18 Spray Screen, in Mix Mode

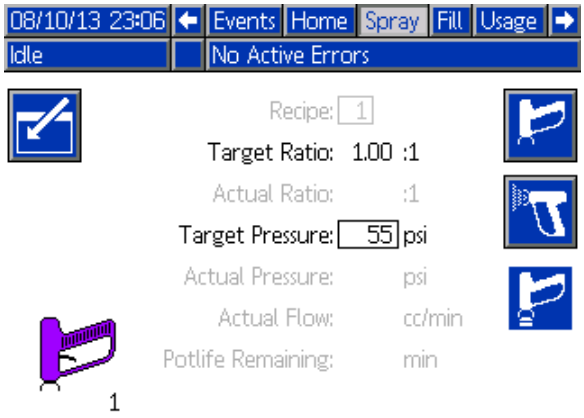


Figure 19 Spray Screen, in Idle Mode

Fill Screen

The Fill screen displays the following information for the pump assigned to the current color:

- Material. Select Color (A), Catalyst (B), or Solvent. The pump animation at the top of the screen will show the selected material. If solvent is selected, enter the pump number in the box to the right.
- Flush Line (only for systems with color change). Select this box if you want to flush the specified material line with solvent. The system uses flush sequence 1.

To prime the pumps and fill the lines, first read Prime and Fill the System, page 25.

1. Press the Edit softkey to open the screen for editing.
2. Select Color (A).
3. Enter the color number in the box to the right.
4. If the selected material is not already loaded, press the Prime softkey . The system will prime Color (A) into the selected pump through the selected color valve and out the outlet dump valve.
5. Press the Fill softkey . The system will attempt to fill the Color (A) lines until the user presses Stop . Trigger the gun into a waste container.
6. Repeat for Catalyst (B).

To flush the system (pump and fluid lines), see Flush the System, page 28.

To flush only the pump:

1. Press the Edit softkey to open the screen for editing.
2. Select Solvent.
3. Enter the pump number in the box to the right.
4. Press the Prime softkey . The system will flush solvent through the selected pump and out the dump valve.

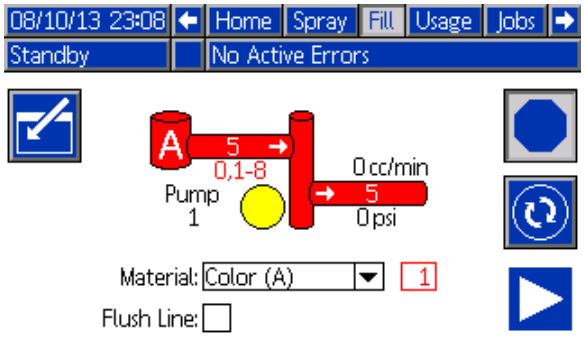


Figure 20 Fill Screen, Color (A) Selected

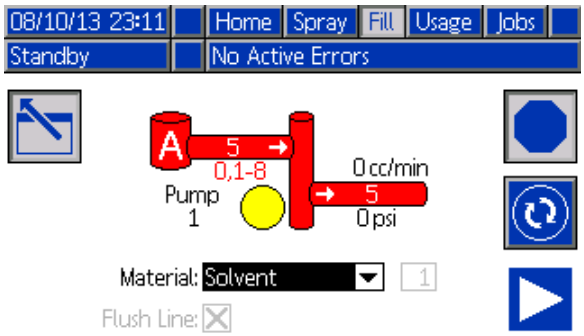


Figure 21 Fill Screen, Solvent Selected

Usage Screen

The first Usage screen displays the current job usage and grand total usage of component A, B, A+B, and solvent (S). The second Usage screen displays the total volume pumped for all available materials.

1. Press the Edit softkey to open the screen for editing.
2. To enter or change the User ID (), select the field to open the User ID Keyboard screen, and enter the desired name (10 characters maximum).
3. To log the current job, press the Job Complete softkey . This will clear the current usage fields and increment to the next job number. The Grand Totals cannot be cleared. See the Jobs Screen, page 37, to review past jobs.
4. Press the Edit softkey to close the screen.

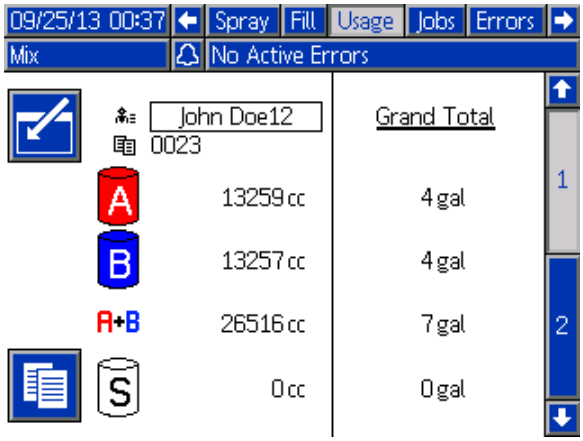


Figure 22 Usage Screen

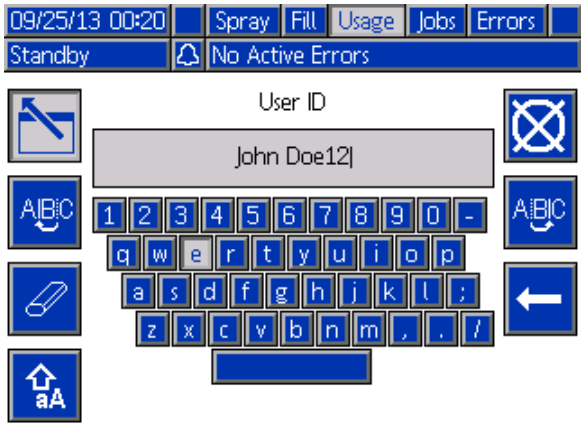


Figure 23 User ID Keyboard Screen

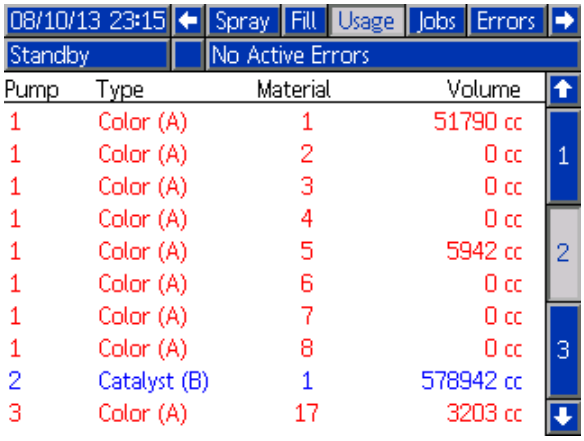


Figure 24 Usage Log

Jobs Screen

The Jobs screen displays the 200 most recent job numbers, recipes, and A+B volumes in a log, with date, time, and User ID.

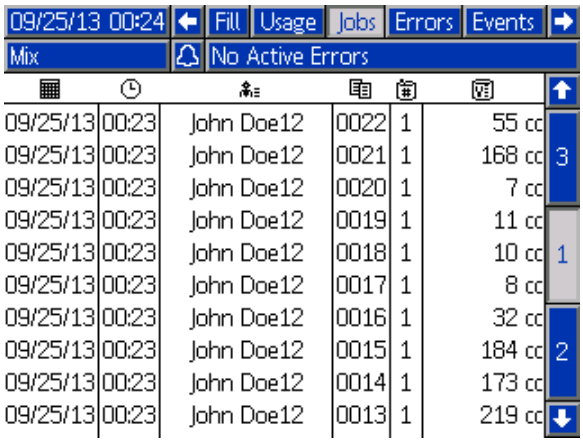


Figure 25 Jobs Screen

Errors Screen

The Errors screen displays the 200 most recent Error Codes in a log, with date, time, and description.

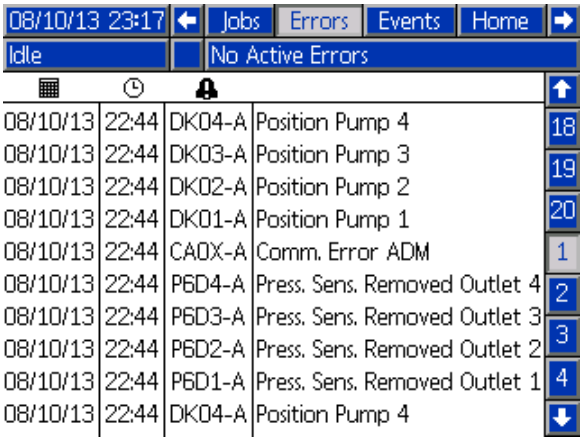


Figure 26 Errors Screen

Events Screen

The Events screen displays the 200 most recent Event Codes in a log, with date, time, and description.

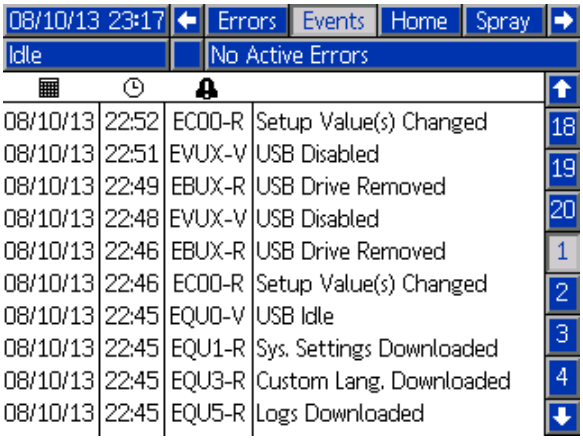


Figure 27 Events Screen

Setup Mode Screens

Press on any Run screen to enter the Setup screens.

NOTE: Selection fields and buttons that are grayed-out on the screens are not currently active.

If the system has a password lock, the Password screen displays. See Password Screen, page 38.

Password Screen

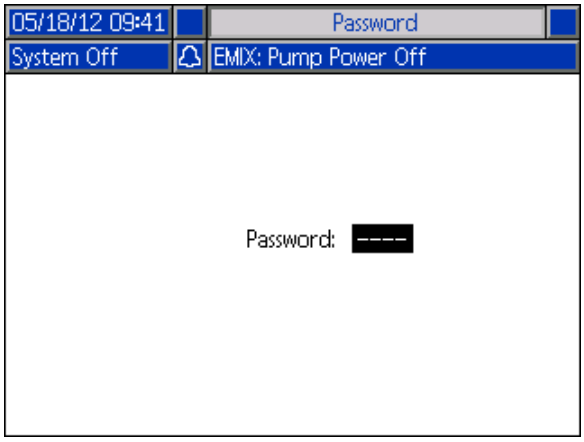


Figure 28 Password Screen

Enter the 4 digit password, then press . System screen 1 will open, allowing access to the other Setup screens.

Entering an incorrect password clears the field. Reenter the correct password.

To assign a password, see Advanced Screen 1, page 55.

System Screen 1

System screen 1 includes the following fields which define your system.

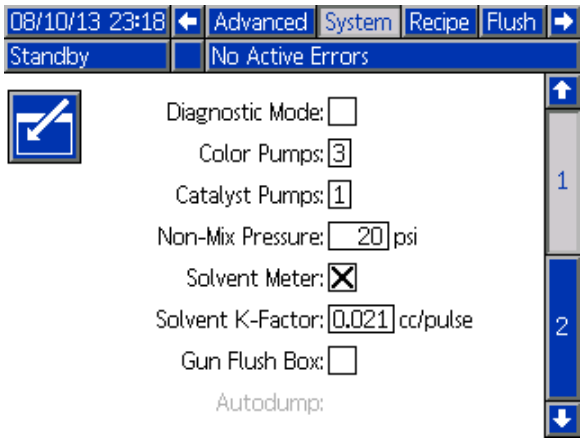


Figure 29 System Screen 1, During Standby

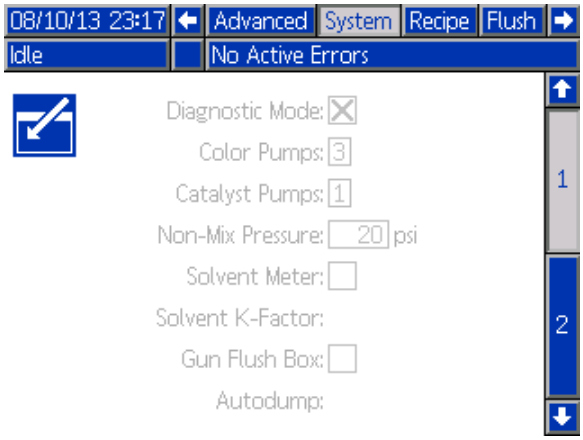


Figure 30 System Screen 1, During Idle

Diagnostic Mode

Select this box to display flow rate and pressure for each pump on the Home Screen, page 31.

Color Pumps

Enter the number of color pumps in your system.

Catalyst Pumps

Enter the number of catalyst pumps in your system.

Non-Mix Pressure

Enter a lower pressure for use when not mixing and spraying (for example during fill or flushing).

NOTE: Low pressure systems may be set 100 psi (0.7 MPa, 7 bar) lower than target pressure; high pressure systems may be set 300 psi (2.1 MPa, 21 bar) lower than target pressure.

Solvent Meter

Select this box if your system uses a solvent meter. The Solvent K-Factor field will then become active.

Solvent K-Factor

Enter the solvent meter K-Factor.

Select Gun Flush Box

Select this box if your system uses a gun flush box. The Autodump function will then become selectable.

Autodump

Select this box to activate the Autodump function.

System Screen 2

System screen 2 sets the following system operating parameters.

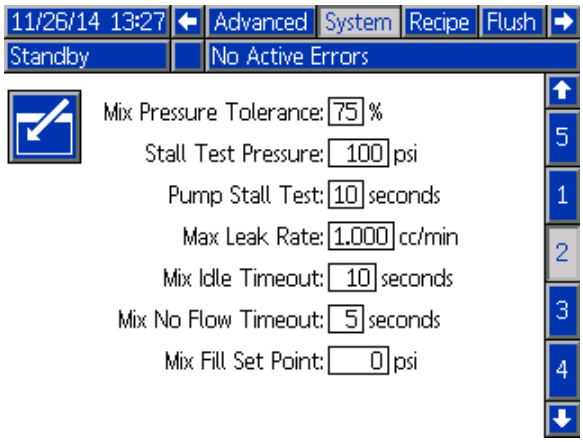


Figure 31 System Screen 2, in Standby Mode

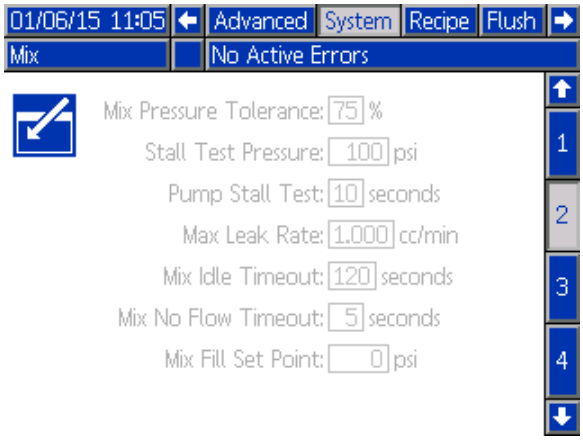


Figure 32 System Screen 2, in Mix Mode

Mix Pressure Tolerance

The pressure of one component must be within a percentage (±) of the pressure of the other component during spray or mix. Set the desired Mix Pressure Tolerance in this field. The default is 75%.

Mix Idle Timeout

The air flow switch (AFS) detects air flow to the gun and signals that the gun is triggered. If you are not using an air flow switch, the system does not know if the gun is spraying. If a pump failed you could spray pure resin or catalyst without knowing. This should be caught by the Mix No Flow Timeout; the default is 5 seconds. The Mix Idle Timeout will trigger Idle mode, which will run a pump stall test to check for leaks, then put the pumps in Standby (holding their current position) after the designated period of time. Enter the desired Mix Idle Timeout in this field.

See Air Flow Switch (AFS) Function, page 61.

Mix No Flow Timeout

The air flow switch (AFS) detects air flow to the gun and signals that the gun is triggered. If the air flow switch indicates that the gun is triggered, but there is no fluid flow through a pump, you could spray pure resin or catalyst without knowing. The Mix No Flow Timeout will cause the system to shutdown after the designated period of time. The default is 5 seconds. Enter the desired shutdown time in this field.

See Air Flow Switch (AFS) Function, page 61.

Stall Test Pressure

Set the minimum stall test pressure. The setting should be approximately 50 psi (0.35 MPa, 3.5 bar) higher than the highest inlet pressure.

Pump Stall Test

Set the duration for the pump stall test. See Calibrate Screen 1, page 51.

Maximum Leak Rate

Enter the maximum allowable leak rate for a pump stall test.

Mix Fill Set Point

Set a higher pressure for use while mix filling. This higher pressure decreases the time needed to fill the gun. Once the gun is filled, the system uses the recipe's target pressure setpoint (set on Recipe Screen, page 45) for mixing.

The default value is 0. When set to 0, the system ignores the Mix Fill Set Point and instead uses the Non-Mix Pressure (set on System Screen 1, page 39) while mix filling.

System Screen 3

System screen 3 sets the following system operating parameters.

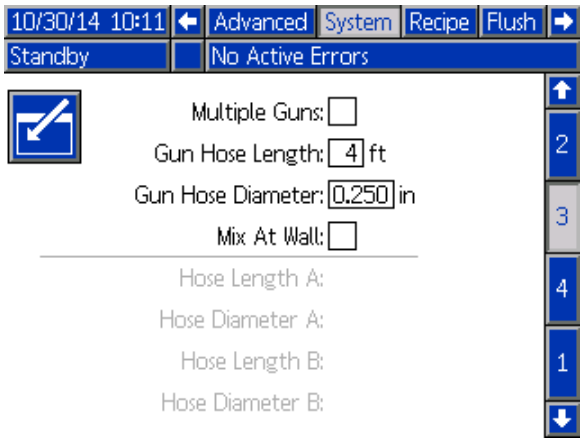


Figure 33 System Screen 3

Multiple Guns

Enable this option if multiple guns will be loaded with mixed material at the same time. This feature will track the pot life of up to 60 different guns. See Information for Systems with Multiple Guns, page 43.

NOTE: If Multiple Guns is enabled, the Gun Hose Length, Gun Hose Diameter, and Mix at Wall fields are disabled.

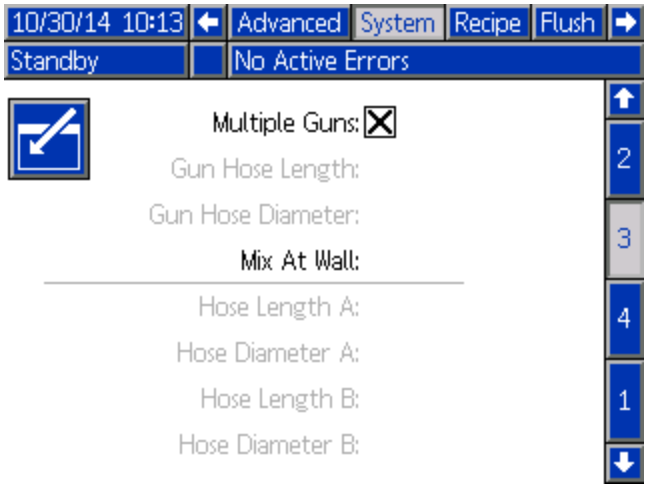


Figure 34

Gun Hose Length

Enter the length of the hose from the mix manifold to the gun.

Gun Hose Diameter

Enter the diameter of the hose from the mix manifold to the gun. The minimum diameter is 1/8 in. (3 mm).

Mix At Wall

Select this box if a remote mix manifold is used in your system.

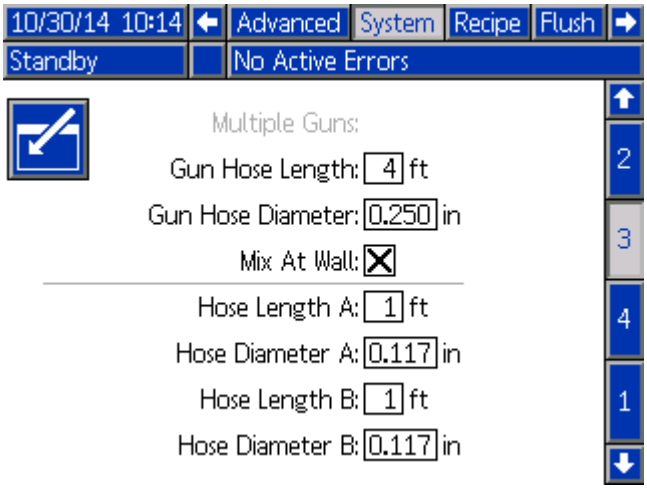


Figure 35

Hose Length and Diameter

Enter the length and diameter of the hose from the remote color stack to the remote mix manifold, for both A and B hoses.

NOTE: These fields are enabled only if Mix at Wall is enabled.

Information for Systems with Multiple Guns

The Multiple guns feature enables the ability to simultaneously track up to 60 different mixed material recipes, each loaded into a dedicated gun. This feature is enabled on System Screen 3, page 42.

Recipe Screen

Because the system has a dedicated gun for each recipe, the associated hose length and diameters could be unique. Therefore, these parameters are disabled on System Screen 3, page 42, and now appear on the Recipe Screen, page 45. Enter the hose length and diameter for a gun that will spray a particular recipe.

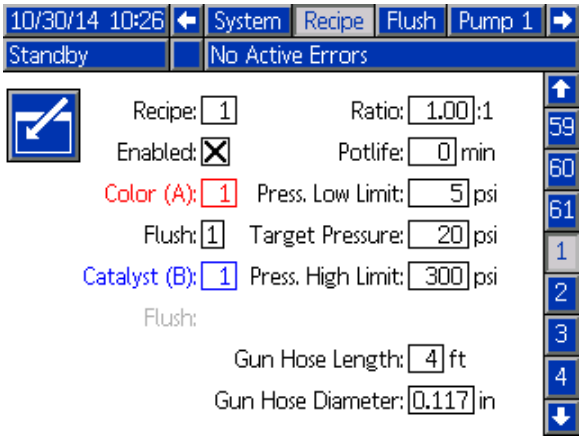


Figure 36

Potlife Screen

In Run mode, the Potlife Screen appears in the menu bar between Fill and Usage. This screen displays how much time remains in the potlife of any given recipe (gun). Recipes are highlighted and show remaining potlife time only if that gun is filled with mixed material and has a non-zero potlife.

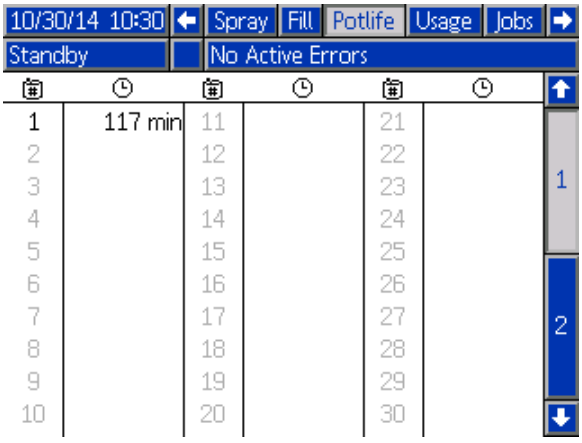


Figure 37

Changing Recipes or Purging

When Multiple Guns is enabled, the Spray Screen allows the user either to change the active recipe (the recipe that is loaded in the pumps) or to purge a particular gun (recipe). Select either Recipe or Purge from the dropdown menu and enter the recipe number. Use the Purge soft key to purge the active recipe.

These actions also can be done using the Booth Control. Use the normal procedure to change the active recipe or to purge the active gun. See Booth Control, page 22. To purge a gun that is not active currently, scroll Up or Down to the desired recipe. Then press Purge. If Purge is not pressed within 5 seconds, the system will revert to the active recipe number.

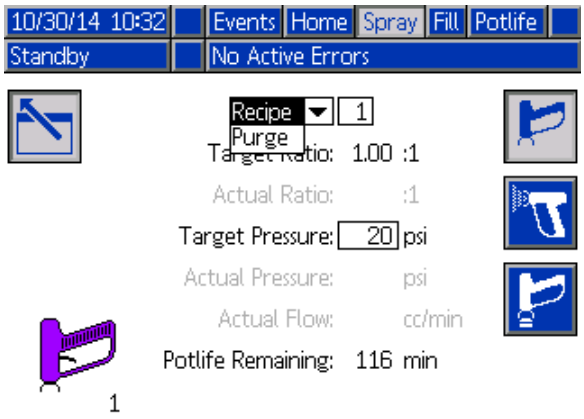


Figure 38

System Screen 4

System screen 4 sets the following system operating parameters. This screen is needed only for systems that use AWI.

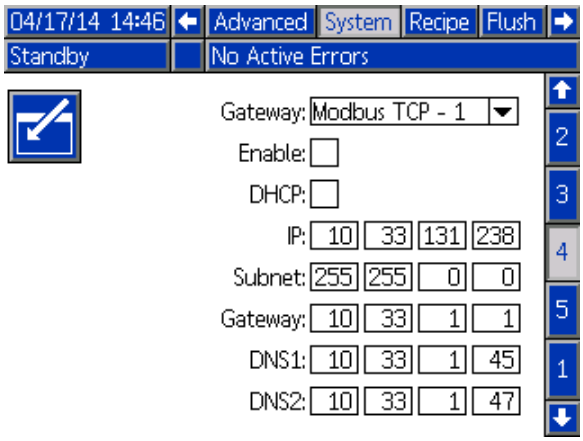


Figure 39 System Screen 4

Gateway ID

Select the desired Gateway ID from the dropdown menu.

Enable

Uncheck Enable while setting the IP Address, Subnet mask, Gateway, DNS1 or DNS2. When the settings are loaded, check the Enable box to write the new settings to the selected Gateway.

Check this box to enable the selected Gateway so that the PLC can communicate with it.

DHCP

Select this box if your system has a Dynamic Host Configuration Protocol (DHCP). This protocol assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and rejoin the network. If selected, the IP Address, Subnet, and Gateway fields will not be editable and will display the addresses supplied by the DHCP.

TCP/IP

Use the remaining fields to set the IP address, subnet mask, Gateway, DNS1, and DNS2.

Recipe Screen

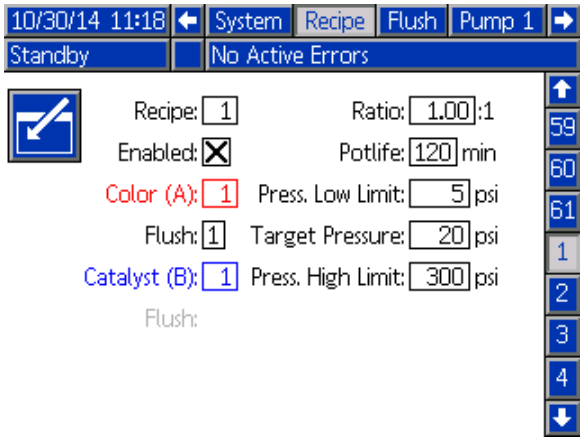


Figure 40 Valid Recipe Screen

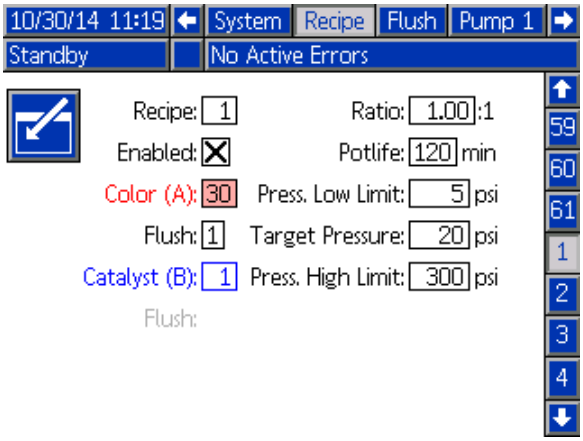


Figure 41 Invalid Recipe Screen

Recipe

Enter the desired recipe number (1-60).

Recipe 0

Use Recipe 0 to flush the system.

- **If a recipe (1–60) is loaded:** Select Recipe 0 to flush the previously active pumps and purge the gun.
- **If Recipe 0 or 61 is loaded:** Select Recipe 0 to flush all pumps and purge the gun.

Enabled

Selecting “Enabled” makes the selected recipe accessible from the booth control, in addition to the ADM. The booth operator can then quickly select a desired recipe, without scrolling through all 60.

Color (A) Valve

Enter the desired color valve number (1-30).

NOTE: If you enter a number which is not valid in your system configuration, the field will be highlighted and the recipe becomes invalid. For example, if your configuration has 8 color valves and you enter 30, the field will appear as shown below.

Catalyst (B) Valve

Enter the desired catalyst valve number (1-4).

NOTE: If you enter a number which is not valid in your system configuration, the field will be highlighted and the recipe is invalid. For example, if your configuration has 1 catalyst valve and you enter 4, the field will be highlighted and the recipe is invalid.

Flush Sequence

Enter the desired flush sequence (1-5). For hard to flush colors, select a longer sequence. 1 is the default, and should be designated for the longest, most thorough flush duration.

If Mix at Wall is enabled on System Screen 3, enter the desired flush sequence (105) for the color (A) valve and the catalyst (B) valve. The gun purge time for each material depends on the flush sequence assigned to each. See Flush Screen, page 47. If materials A and B require different purge times, assign separate flush sequences. Set the necessary gun purge time for each. For hard to flush colors, select a longer sequence. Flush sequence 1 is the default, and should be designated for the longest, most thorough flush duration.

Mix Ratio

Enter the desired mix ratio (0 to 50.0):1.

Potlife Time

Enter the potlife time (0 to 999 minutes). Entering 0 disables this function.

Pressure Low Limit

Enter the lowest target pressure which the operator is allowed to enter from the Spray screen or booth control. The default is 5 psi (.035 MPa, 0.35 bar).

Target Pressure

Enter the desired target spray pressure. This is the pressure the pumps will maintain at the outlet. The default is 20 psi (0.14 MPa, 1.4 bar).

Pressure High Limit

Enter the highest target pressure which the operator is allowed to enter from the Spray screen or booth control. The default is 300 psi (2.1 MPa, 21.0 bar).

NOTE: If you enter an invalid pressure for your system's parameters, the field will be highlighted and the recipe is invalid. For example, if you enter 1500 psi (10.5 MPa, 105 bar) in a low pressure system, the field will be highlighted and the recipe becomes invalid.

Flush Screen

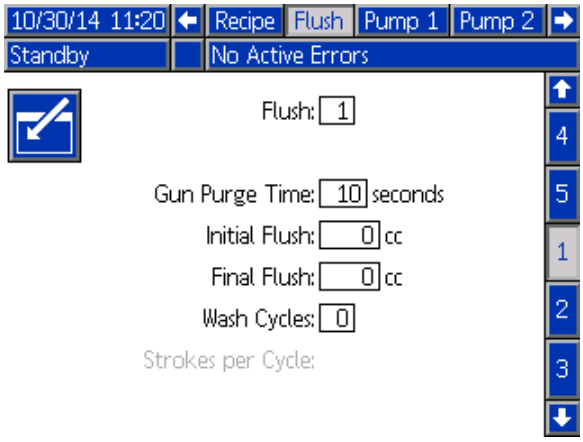


Figure 42 Flush Screen

Flush Number

Enter the desired flush sequence (1-5). For hard to flush colors, select a longer sequence. 1 is the default, and should be designated for the longest, most thorough flush duration.

Gun Purge Time

Enter the gun purge time (0 to 999 seconds).

Initial Flush

Enter the initial flush volume (0 to 9999 cc).

Final Flush

Enter the final flush volume (0 to 9999 cc).

Wash Cycles

A Wash Cycle activates the pump with the valves closed, to use pumping motion to thoroughly clean the pump. Enter the desired number of wash cycles (0 to 99). Entering a number will make the Strokes per Cycle field active.

Strokes per Wash Cycle

Enter the desired pump strokes per wash cycle (0 to 99). Default is 1.

Pump Screen 1

NOTE: Your system may include 2, 3, or 4 pumps. Information for each pump is accessible under a separate tab in the menu bar at the top of the screen. Select the tab for the desired pump. Each pump has three screens. Only the screens for Pump 1 are shown here, but the same fields appear on all.

Pump screen 1 includes the following fields which define the pump.

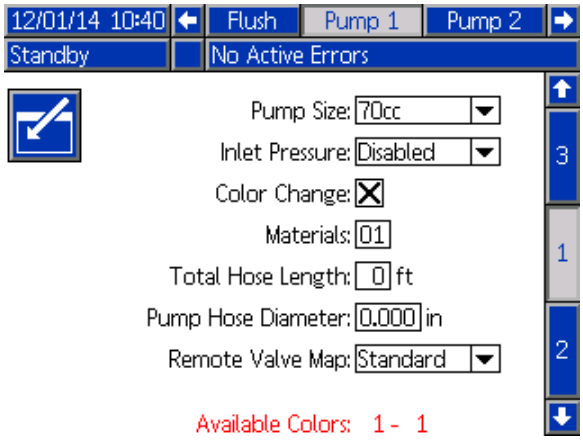


Figure 43 Pump Screen 1 — Resin Pump

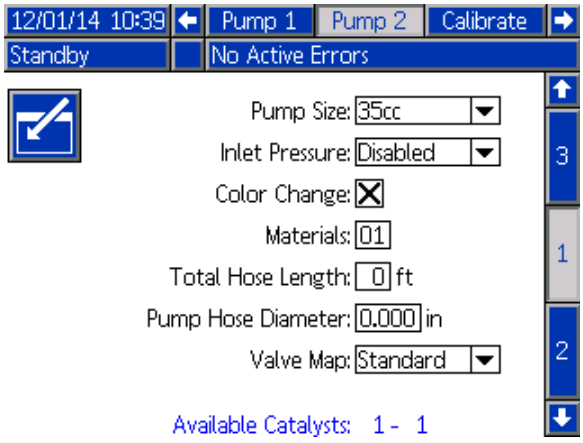


Figure 44 Pump Screen 1 — Catalyst Pump

Pump Size

Select 35cc or 70cc, as appropriate.

Inlet Pressure

Select one of the following:

- Disabled
- Monitor, to track inlet pressure

Select Color Change

Select this box if your system uses color change.

Materials

Enter the number of materials used in your system. Each color change module controls 8 colors.

Total Hose Length

Compute the length of the hoses from the supply stack to the pump and from the pump to the outlet stack. Enter the total length.

Pump Hose Diameter

Enter the diameter of the supply and output hoses.

Valve Mapping

Remote Valve Map

NOTE: This valve mapping dropdown menu displays if the pump is a resin pump with Color Change selected on this screen and Mix at Wall enabled on System Screen 3, page 42.

Select whether to use the standard color change valve mapping or one of two alternate color change valve mappings for the remote valve stack. See the Color Change and Remote Mix Manifold manual 333282 for more information.

Valve Map

NOTE: This valve mapping dropdown menu displays if the pump is a catalyst pump with Color Change selected on this screen.

Select whether to use the standard color change valve mapping or the alternate color change valve mapping for the catalyst pump(s). See the Color Change and Remote Mix Manifold manual 333282 for more information.

Available Colors

The module displays the number of colors available in your system. This field is not editable.

Pump Screen 2

Pump screen 2 sets the pressure transducer settings for the pump.

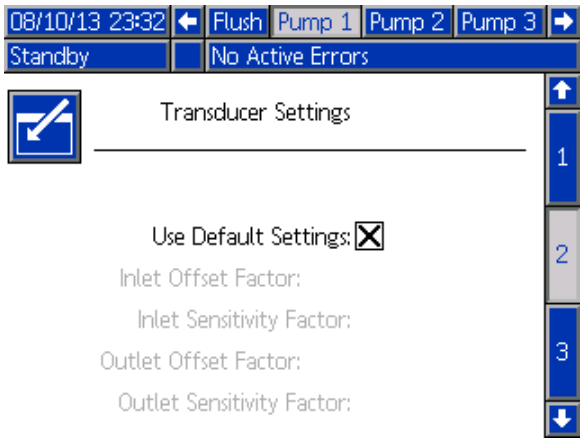


Figure 45 Pump Screen 2, Default Settings Enabled

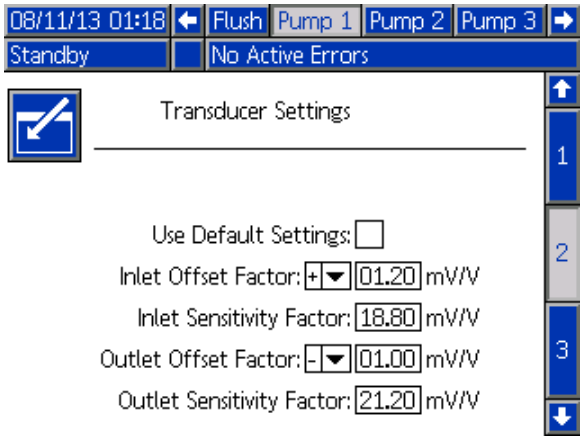


Figure 46 Pump Screen 2, Default Settings Disabled

Default Settings Selected

When the “Use Default Settings” box is selected, default settings are used for the calibration values, and the fields are grayed out.

Default Settings Not Selected

When the “Use Default Settings” box is not selected, the following calibration values must be entered. Invalid values will be over-ridden and the system will automatically select the default settings.

- Inlet Offset Factor: This field is only used if **Inlet Pressure** in Pump Screen 1, page 48 is set to Monitor; it is grayed out if set to Disabled. The valid range is -01.20 to +01.20 mV/V.
- Inlet Sensitivity Factor: This field is only used if **Inlet Pressure** in Pump Screen 1, page 48 is set to Monitor; it is grayed out if set to Disabled. The valid range is 18.80 to 21.20 mV/V.
- Outlet Offset Factor: The valid range is -01.20 to +01.20 mV/V.
- Outlet Sensitivity Factor: The valid range is 18.80 to 21.20 mV/V.

Pump Screen 3

Pump screen 3 sets the pressure alarm limits for the pump.

When **Inlet Pressure** in Pump Screen 1, page 48 is set to Disabled, the inlet limit fields are grayed out and only the outlet limit fields are active. See Pressure Alarm and Deviation Limits, page 50.

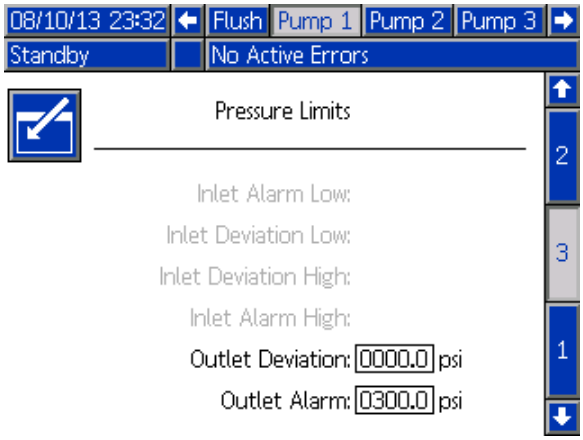


Figure 47 Pump Screen 3, Pressure Monitoring Disabled

When **Inlet Pressure** in Pump Screen 1, page 48 is set to Monitor, all fields are active. See Pressure Alarm and Deviation Limits, page 50.

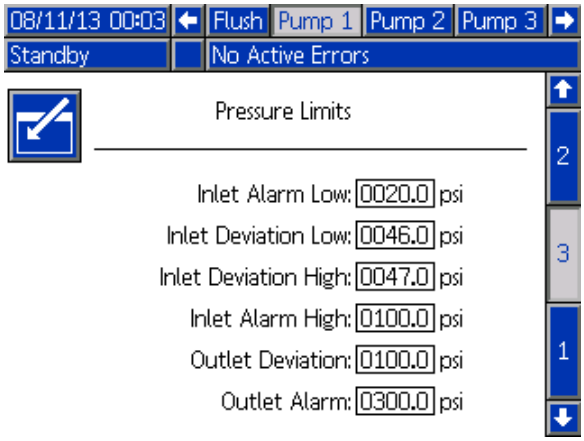


Figure 48 Pump Screen 3, Pressure Monitoring Enabled

Pressure Alarm and Deviation Limits

Inlet fields are only active if **Inlet Pressure** in Pump Screen 1, page 48 is set to Monitor; they are grayed out if set to Disabled. Outlet fields are active at all times.

- Alarm and Deviation ranges are 0-300 psi for low pressure systems, and 0-1500 psi for high pressure systems.
- Setting to 0 will disable the alarm. The Inlet Alarm High and Outlet Alarm High **cannot** be disabled.
- Alarms and Deviations will display when the inlet or outlet pressure drops below the low limit or exceeds the high limit.

Calibrate Screen 1

Calibrate Screen 1 initiates a pump pressure check (stall test) for the selected pump. During the test, the Stall Test screen will appear.

The pump and lines must be primed with color or catalyst before doing the stall test. See System Screen 2, page 40 to set test parameters. See Pump Pressure Check, page 57 for complete test instructions.

To initiate the test, press the Pressure Check button for the desired pump. The pump will build pressure in the line to a minimum of the Stall Test Pressure. The pump will then move to the center stroke position and stall test the upstroke, followed by the downstroke.

NOTE: The Last Passed log can only be reset by successfully completing the test.

The screen displays the number of days since the last stall test was passed for each pump.

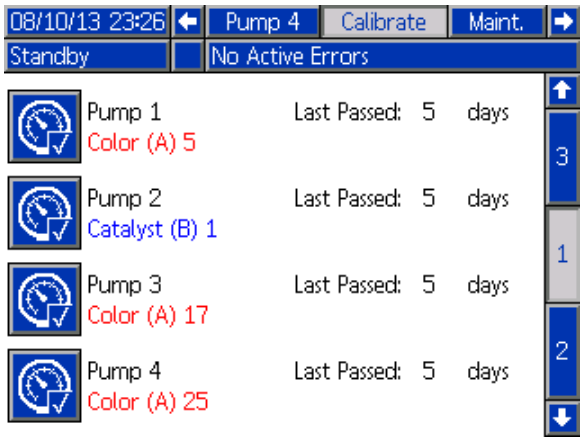


Figure 49 Calibrate Screen 1

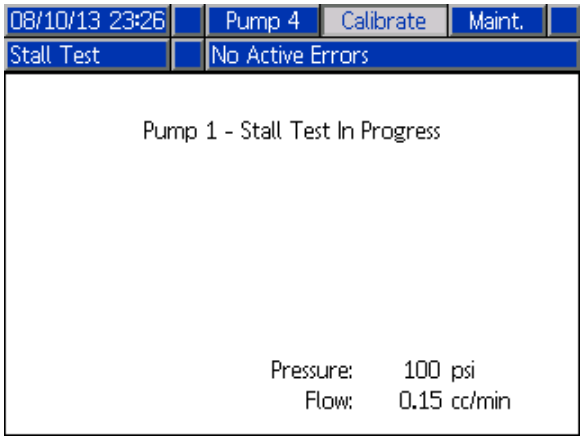


Figure 50 Stall Test Screen

Calibrate Screen 2

Calibrate Screen 2 initiates a volume test for the selected pump. During the test, the Volume Check screen will appear.

The pump and lines must be primed with color or catalyst before doing the Volume Check. See Pump Volume Check, page 58 for complete test instructions.

To initiate the test, press the Volume Check button for the desired pump.

The screen displays the volume dispensed. Press to end the test.

Press and hold the Reset button for 1-2 seconds to reset the volume counter.

Figure 51 Calibrate Screen 2

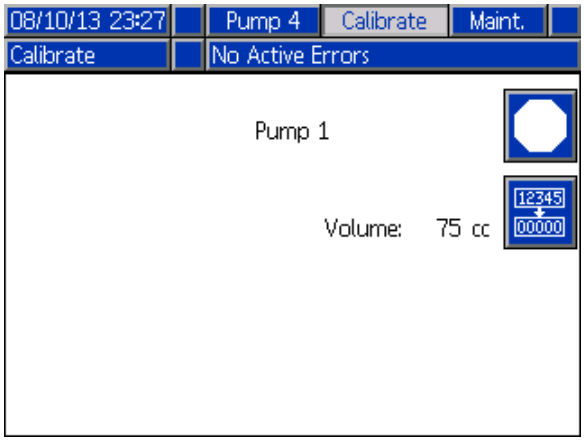


Figure 52 Volume Check Screen

Calibrate Screen 3

Calibrate Screen 3 initiates a calibration of an accessory solvent meter. During the test, the Volume Verification screen will appear.

The meter and lines must be primed with solvent before doing the calibration. See Solvent Meter Calibration, page 59 for complete instructions.

To initiate the calibration, press the Volume Check button.

The screen displays the volume dispensed. Enter the amount of solvent dispensed in the Measured Volume field, or press to end the test.

After the Measured Volume is entered, the Accept Calibration window will appear. Press to accept the calibration. Press to cancel the calibration and retain the previous K-factor.

Press and hold the Reset button for 1-2 seconds to reset the volume counter.

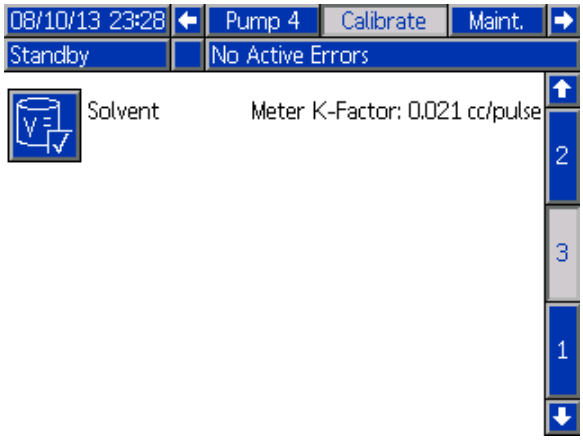


Figure 53 Calibrate Screen 3

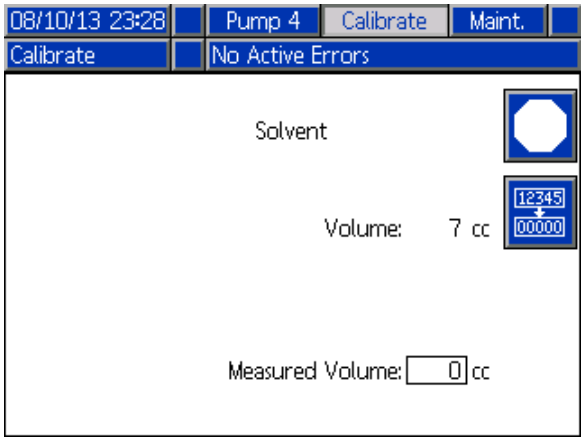


Figure 54 Enter Measured Volume of Solvent

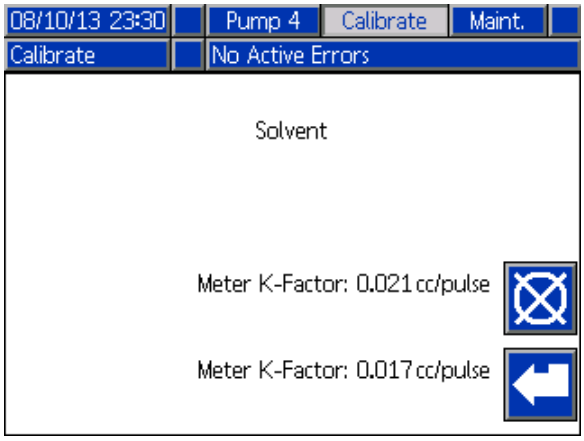


Figure 55 Accept Calibration

Maintenance Screen 1

Use this screen to set maintenance intervals. Set to 0 to disable the alarm.

NOTE: The Pump Stall Test cannot be disabled. You must enter a value other than 0.

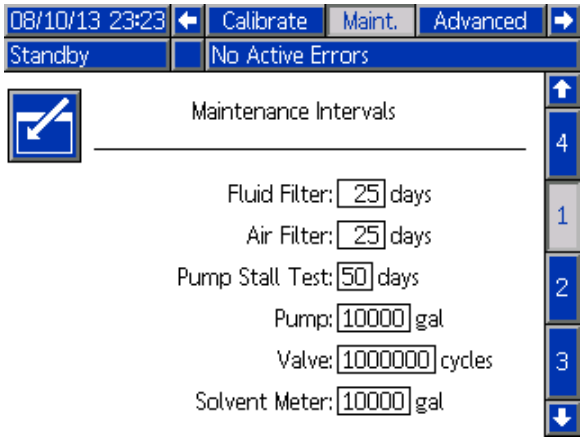


Figure 56 Maintenance Screen 1, Interval Settings

Maintenance Screen 2

Maintenance screen 2 shows the current interval status of the solvent meter, fluid filter, and air filter.

Press and hold the Reset button 12345 00000 for 1-2 seconds to clear the alarm and reset the counter.

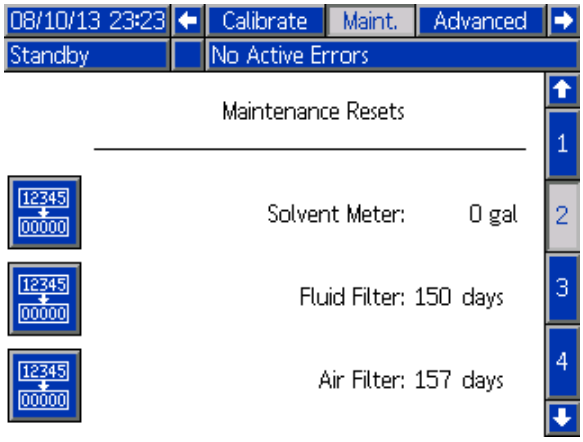


Figure 57 Maintenance Screen 2, Current Status

Maintenance Screen 3

Maintenance screen 3 shows the current interval status of the pump maintenance tests.

Press and hold the Reset button 12345 00000 for 1-2 seconds to clear the alarm and reset the counter.

NOTE: The Pump Stall Test can only be reset by successfully completing the test.

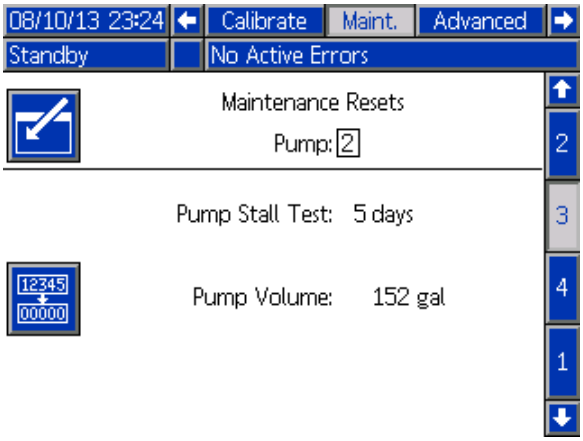


Figure 58 Maintenance Screen 3, Current Pump Status

Maintenance Screen 4

Maintenance screen 4 displays cycle counts for a selected color, catalyst, or solvent valve.

Press and hold the Reset button for 1-2 seconds to reset the counter.

If the system is in Standby, valves can be opened or closed by selecting or deselecting the box for the corresponding valve.

NOTE: Gun valves are available only if Mix at Wall is enabled on System Screen 3, page 42.

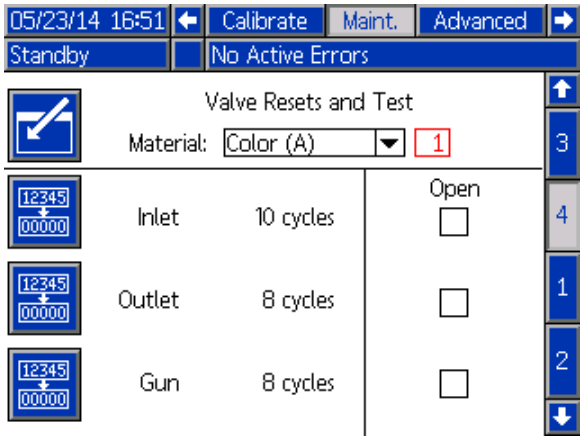


Figure 59 Maintenance Screen 4, Color Valve Resets

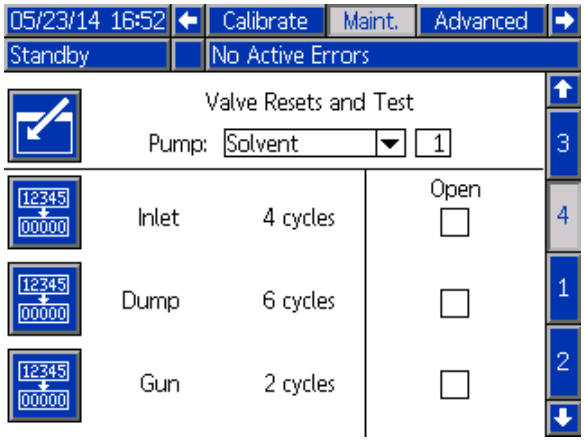


Figure 60 Maintenance Screen 4, Solvent Valve Resets

NOTE: When Solvent is selected in the Material field, the number to the right of “Solvent” is the pump number, not the material number.

Advanced Screen 1

Advanced screen 1 sets the following display parameters.

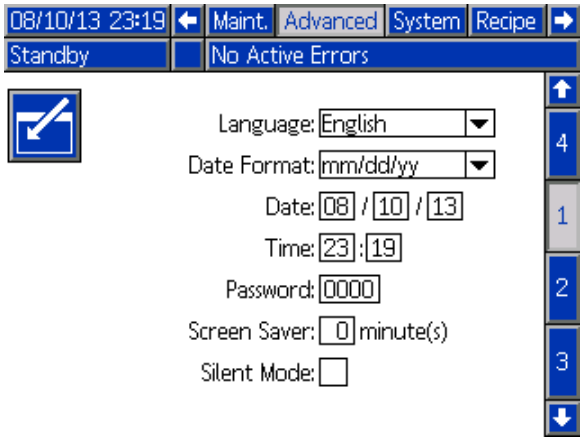


Figure 61 Advanced Screen 1

Language

Defines the language of the screen text. Select:

- English (default)
- Spanish
- French
- German
- Japanese
- Chinese
- Korean
- Dutch
- Italian
- Portuguese
- Swedish
- Russian

Date Format

Select mm/dd/yy, dd/mm/yy, or yy/mm/dd.

Date

Enter the date, using the format selected. Use two digits for the month, day, and year.

Time

Enter current time in hours (24 hour clock) and minutes. Seconds are not adjustable.

Password

The password is only used to enter Setup mode. The default is 0000, which means no password is required to enter Setup. If a password is desired, enter a number from 0001 to 9999.

NOTE: Be sure to write down the password and keep it in a secure location.

Screen Saver

Select the desired screen timeout in minutes (00-99). 5 is the default. Select zero (0) to disable the screen saver.

Silent Mode

Select Silent Mode to disable the alarm buzzer and audible feedback.

Advanced Screen 2

Advanced screen 2 sets display units (US or metric).

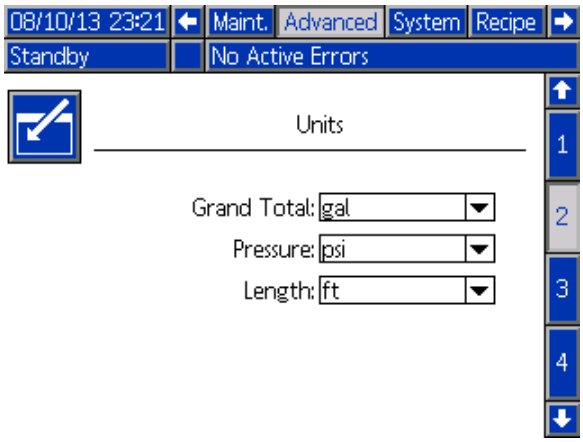


Figure 62 Advanced Screen 2

Display Units

Select the desired display units:

- Grand Total Volume (US gallon or liter)
- Pressure (psi, bar, or MPa)
- Length (ft or m)

Advanced Screen 3

Advanced screen 3 enables USB downloads and uploads.

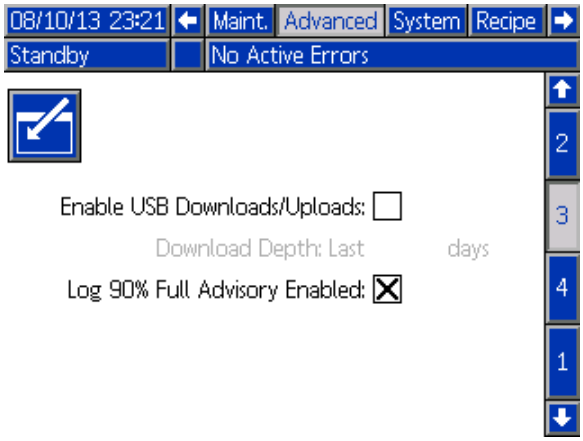


Figure 63 Advanced Screen 3

Enable USB Downloads/Uploads

Select this box to enable USB downloads and uploads. Enabling USB activates the Download Depth field.

Download Depth

Enter the number of days for which you want to retrieve data. For example, to retrieve data for the previous week, enter 7.

Log 90% Full Advisory Enabled

This selection is enabled by default. When enabled, the system will issue an advisory if the memory log has reached 90% of capacity. Perform a download to avoid loss of data.

Advanced Screen 4

Advanced screen 4 displays the software part numbers and versions for the system components. This is not an editable screen.

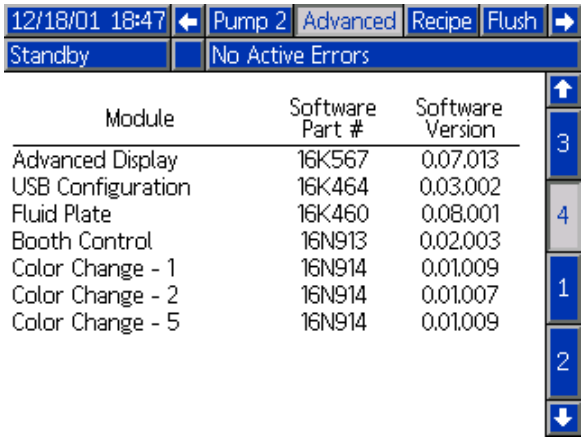
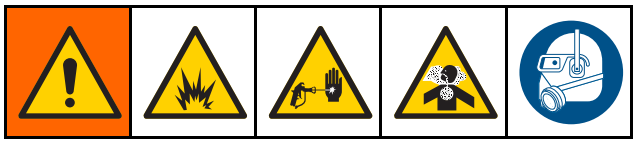


Figure 64 Advanced Screen 4

Calibration Checks

Pump Pressure Check

NOTE: Enter the transducer calibration data before doing the pressure check.



Perform the pressure check:

- The first time the system is operated.
- Whenever new materials are used in the system, especially if the materials have viscosities that differ significantly.
- At least once per month as part of regular maintenance.
- Whenever a pump is serviced or replaced.

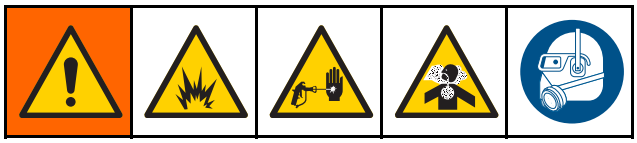
During each pressure test, the dose valve will close during an up stroke and a down stroke (in either order). This test is to verify that the valves are seating properly and not leaking. If leaking occurs, the system will alarm after the test for that particular pump direction.

NOTE: Do not trigger the gun during the pressure check.

1. Set the mix manifold to the SPRAY position.
2. The pump and lines must be primed with color or catalyst before doing the Pressure Check. See Prime and Fill the System, page 25.
3. If the display is on a Run Mode screen, press to access setup screens.
4. Scroll to Calibrate to display Calibrate Screen 1, page 51.
5. Press the Pressure Check button for the desired pump. The pump will build pressure in the line to a minimum of the Stall Test Pressure. The pump will then move to the center stroke position and stall test the upstroke, followed by the downstroke.
6. The pressure and flow that the unit measured are displayed on the screen. Compare with the maximum leak rate entered on System Screen 2, page 40. If the values are substantially different, repeat the test.

   NOTE: The stall test pressure set point is a minimum. The system may stall at a higher pressure depending on hose lengths and fluid composition.

Pump Volume Check



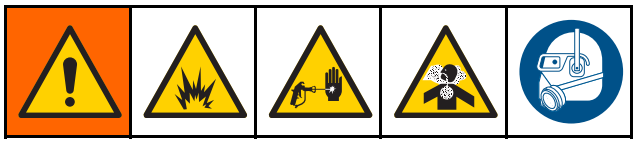
1. Set the mix manifold to the SPRAY position.
2. The pump and lines must be primed with color or catalyst before doing the Volume Check. See Prime and Fill the System, page 25.
3. If the display is on a Run Mode screen, press to access setup screens.
4. Scroll to Calibrate in the menu bar.
5. Scroll to Calibrate Screen 2, page 51.
6. Press the soft key for the pump you want to check.

   NOTE: For maximum accuracy, use a gravimetric (mass) method to determine the actual volumes dispensed. Verify that the fluid line is filled and at the proper pressure before checking. Air in the line or pressure that is too high may cause incorrect values.
7. Press the Reset key . The volume counter will reset to 0.
8. Trigger the gun into a graduated cylinder. Dispense a minimum of 500cc of material.
9. The volume that the unit measured displays on the screen.
10. Compare the amount on the screen to the amount in the graduated cylinder.

    NOTE: If the value is substantially different, repeat the test. If the dispensed volume and measured volume still do not match, check that the A and B pump positions are not reversed.

    NOTE: Stop triggering the gun and press to cancel the test.

Solvent Meter Calibration



1. Set the mix manifold to the FLUSH position.
2. The meter and lines must be primed with solvent before doing the calibration. See Prime and Fill the System, page 25.
3. If the display is on a Run Mode screen, press to access setup screens.
4. Scroll to Calibrate in the menu bar.
5. Scroll to Calibrate Screen 3, page 52.
6. Press the soft key to initiate the calibration.

   NOTE: For maximum accuracy, use a gravimetric (mass) method to determine the actual volumes dispensed.

   NOTE: Verify that the fluid line is filled and at the proper pressure before calibrating. Air in the line or pressure that is too high may cause incorrect calibration values.
7. Trigger the gun into a graduated cylinder. Dispense a minimum of 500cc of material.
8. The volume that the unit measured displays on the screen.
9. Compare the amount on the screen to the amount in the graduated cylinder.

   NOTE: If the value is substantially different, repeat the calibration process.
10. Enter the amount of solvent dispensed in the Measured Volume field on the screen.
11. After the measured volume is entered, the controller calculates the new solvent meter K-factor and displays it on the screen. The standard meter K-factor is 0.021 cc/pulse.
12. Press to accept the calibration. Press to cancel the calibration and retain the previous K-factor.

Color Change

Color Change Module Kits are available as an accessory. See manual 332455 for complete information.

Single Color Systems

1. Follow the procedure under Flush the System, page 28.
2. Load the new color. See Prime and Fill the System, page 25.
3. Press the Mix key to start spraying.

Multiple Color Systems

1. Press Standby .
2. Set the current mix manifold to FLUSH.
3. Select the new recipe at the Booth Control or on the Spray Screen, page 34. This will change colors in the pump and initiate a gun purge. The Standby and Purge indicators should be blinking.

   NOTE: The booth control only displays enabled recipes. If an invalid recipe is entered, the display will show 4 dashes (— — — —). See Recipe Screen, page 45 to enable a recipe.

   NOTE: If Mix at Wall is enabled on System Screen 3, page 42, the system will purge Material B first, then Material A out of the gun. Each material will purge for the amount of time designated by the Flush Sequence selected for that material on the Recipe Screen, page 45.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun. Make sure there is enough flow to open the solvent flow switch.
5. Release the trigger when the solvent flow stops and the Purge indicator stops blinking.

   NOTE: If you are using quick-disconnects at the mix manifold, disconnect the gun from the purged mix manifold and connect it to the new color line.
6. Wait for the color change to complete (the Standby indicator is on solid).
7. Set the mix manifold to SPRAY.
8. Press the Mix key on the booth control. The Mix indicator will be blinking.
9. Trigger the gun to complete the Mix Fill.

   NOTE: There is a 30 second delay without flow before the system will fault.
10. Wait for atomizing air and for the Mix indicator to be on solid, then resume spraying.

System Errors

System errors alert you of a problem and help prevent off-ratio spraying. There are three types: Advisory, Deviation, and Alarm.

An **Advisory** records an event in the system, and will clear itself after 60 seconds.

A **Deviation** records an error in the system but does not shut down the equipment. The deviation must be acknowledged by the user.

If an **Alarm** occurs, operation stops.

If any of the three types occur:

- Alarm buzzer sounds (unless in silent mode).
- Alarm popup screen shows the active alarm code (see Error Codes, page 62).
- Status bar on the Advanced Display Module shows the active alarm code.
- Alarm is saved in the date/time stamped log.

To Clear Error and Restart

NOTE: When a deviation or alarm occurs, be sure to determine the error code before resetting it. If you forget which code occurred, go to the Errors Screen, page 37, to view the last 200 errors, with date and time stamps.

If an alarm has occurred, correct the cause before resuming operation.

To acknowledge a deviation or clear an alarm, press on the Advanced Display Module or on the Booth Control.

Air Flow Switch (AFS) Function

The air flow switch (AFS) detects air flow to the gun and signals the controller when the gun is triggered. The gun icon on the Advanced Display Module shows spray when the AFS is activated.

If a pump fails, pure resin or catalyst could spray indefinitely if the unit does not detect the condition and intervene, which is why the AFS is so important.

If the unit detects through the AFS signal that the gun is triggered, yet one or both of the pumps are not running, a Flow Not Detected Alarm (F8D1) occurs after 10 seconds (default) and the system goes into Standby.

Error Codes

NOTE: When an error occurs be sure to determine the code before resetting it. If you forget which code occurred, use the Errors Screen, page 37 to view the last 200 errors, with date, time, and description.

Purge Errors

Code	Type	Description	Problem	Cause	Solution
F7P1	Alarm	Air Flow Switch On	The air flow switch is indicating unexpected atomizing air flow.	Air flow switch is stuck in flow position.	Clean or replace switch.
				Leak downstream in air line or fitting.	Check for leaks and tighten fittings.
				Air supply pressure fluctuation.	Eliminate pressure fluctuations.
SPD1	Alarm	Gun Purge Incomplete	The system timed out without reaching the user-specified volume of solvent for a purge.	Solvent flow switch not working.	Replace switch.
				Solvent flow is too low to actuate the solvent switch.	Increase solvent pressure to drive a high purge flow rate
				Gun is not triggered.	Operator must continue flushing for configured time, until the booth control indicates purge is completed.
				Mix manifold was not set to flush position, blocking solvent flow to the spray gun.	Set manifold to flush position.

Mix Errors

Code	Type	Description	Problem	Cause	Solution
F7S1	Alarm	Flow Detected Solvent Gun	The solvent flow switch is indicating unexpected solvent flow.	Solvent flow switch is stuck in flow position.	Clean or replace switch.
				There is a leak through the solvent cutoff valve.	Check for leaks and repair valve.
QPD1	Alarm, then Devia-tion	Potlife Expired	Potlife time has expired before the system has moved the required amount of material (potlife volume) through the mixed material line.	Purge process was not completed.	Make sure purge process is completed.
				Solvent supply shut off or empty.	Verify solvent supply is available and on, supply valves are open.
SND1	Alarm	Mix Fill Incomplete	The system timed out before the mix fill cycle loaded the gun with mixed material.	Mix manifold not set to spray position.	Set manifold to spray.
				Spray gun was not triggered.	Allow flow through gun during fill process until the fill complete LED stops flashing.
				Restrictions in mixer, manifold, or spray gun.	Fix restrictions.

Pumping Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. The unit's display will show the applicable number as the last digit in the code. For example, the F1S# code listed in this table will be displayed as F1S1 if the affected component is pump 1, F1S2 for pump 2, and so on.

Code	Type	Description	Problem	Cause	Solution
DA0#	Alarm	Exceeded Maximum Flow Pump #	Pump was driven to its maximum allowed speed.	System has a leak or open valve that is allowing unrestricted flow.	Inspect system for leaks.
				Pump is cavitating, cycling without restriction.	Verify that the pump is being supplied with material.
				Viscosity of material is too thin for nozzle size.	Reduce nozzle size to create more restriction. Reduce paint pressure to lower the flow rate.
				System pressure or Flow Setpoint is too high (causing the pump to work too hard).	Reduce the pressure or the Flow Setpoint.
DE0#	Alarm	Leak Detected Pump #	This is a manual stall test failure when the pump cannot build pressure to the target "Stall Test Pressure." Will fault after 30 seconds.	No material in the pump or line.	Make sure the pump and down stream color line are loaded with material.
				Leak in the system.	Determine if leak is external or internal by visually inspecting the system for fluid leakage. Fix all loose or worn hoses, fittings, and seals. Inspect all valve seats and needles for wear, and replace worn piston or throat seals.
DF0#	Alarm	No Stall Up Pump #	Pump failed the stall test; did not stall on the upstroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for up stroke. Replace piston and throat seals. Replace rod and cylinder as necessary.
DG0#	Alarm	No Stall Down Pump #	Pump failed the stall test; did not stall on the downstroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for down stroke. Replace piston and throat seals. Replace rod and cylinder as necessary.

Code	Type	Description	Problem	Cause	Solution
DH0#	Alarm	No Stall Pump #	Pump failed the stall test; did not stall on either the upstroke or the downstroke.	Valve failure, seal failure, worn rod or cylinder.	Replace inlet and outlet valve and seal for up and down strokes. Replace piston and throat seals. Replace rod and cylinder as necessary.
DK0#	Alarm	Position Pump #	Pump was detected to be out of position.		Re-enable pump power to reset pump. Make sure inlet supply pressure is not too high.
EBH#	Rec-ord	Home Complete Pump #	Record of pump homing is complete.	An indication on the display that the pump completed the home function	No action required.
EF0#	Alarm	Timeout Startup Pump #	Pump tried but was not able to move to the home position within a specified amount of time.	Pump dose valves did not actuate.	Verify air pressure to solenoid valves. Verify the valves are actuating.
				Motor could not drive pumps and linear actuator.	Verify motor is driving the pump.
				Pump stroke length is shortened by mechanical system tolerance.	Verify correct assembly of linear actuator and pump piston rods. See pump manual.
EF1#	Alarm	Timeout Shutdown Pump #	Pump tried but was not able to move to the park position within a specified amount of time.	Pump dose valves did not actuate.	Visually inspect valves to ensure they are operating properly; verify they have air pressure above 85 psi (0.6 MPa, 6.0 bar).
				Pump is filled with thick paint and could not drive piston to end of stroke. Motor or drive is worn or damaged.	Observe motor and drive assembly to verify that the motor is generating force.

Code	Type	Description	Problem	Cause	Solution
F1F#	Alarm	Flow Low Fill Pump #	There has been no flow or low flow during a pump fill operation.	There is a restriction on the outlet side of the pump or color stack.	Make sure there are no restrictions in the color stack and that the dump valve is actuating.
				Thick viscosity paint requires more pressure to pump.	Increase non-mix pressure if necessary to create flow during the fill function.
				The pumps do not have to move for the system to build enough pressure to meet the setpoint.	Increase non-mix pressure if necessary to create flow during the fill function.
F1S#	Alarm	Flow Low Purge Pump #	There has been no flow or low flow during a pump purge operation.	Restriction in the outlet side of the pump or color stack resulting in the solvent flow being too low.	Make sure there are no restrictions in the system. Increase non-mix pressure if necessary to create flow during the purge function.
F7D#	Alarm	Flow Detected Pump #	The pump flow exceeded 20 cc/min flow coming into Idle mode.	There is a leak in the system or the gun was open when the system went into Idle mode.	Verify there are no leaks in the system. Make sure the air flow switch is actuating properly. Do not trigger the gun without atomizing air.
F8D1	Alarm	Flow Not Detected	No flow while mixing.	Restriction in the outlet side of the pump or color stack.	Make sure there are no restrictions in the system.
F9D#	Alarm	Flow Unstable Pump #	The pump flow rate did not stabilize while entering Idle mode.	Potential leak in the system.	Check the system for leaks and run manual stall test.
SAD1	Alarm	Atomizing Solvent	Air flow switch is active while solvent, diluted material, or an unknown material is in the gun.	Atomizing air supply was not shut off before purging or filling spray gun.	Make sure atomizing air is shut off before purging or filling the spray gun. Use an AA cutoff valve on the atomizing air supply.

Pressure Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. The unit's display will show the applicable number as the last digit in the code. For example, the P6F# code listed in this table will be displayed as P6F1 if the affected component is pump 1, P6F2 for pump 2, and so on.

Code	Type	Description	Problem	Cause	Solution
F6F#	Alarm	Press. Sens. Removed Inlet #	No inlet pressure transducer is detected when the system is expecting one.	Disconnected transducer.	Verify transducer is connected properly. Replace if reconnecting does not eliminate the alarm.
P1F#	Alarm	Pressure Low Inlet Pump #	The inlet pressure on pump # is less than the user-entered alarm limit.		Increase inlet pressure.
P2F#	Devi-ation	Pressure Low Inlet Pump #	The inlet pressure on pump # is less than the user-entered deviation limit.		Increase inlet pressure.
P3D#	Devi-ation	Pressure High Outlet Pump #	The outlet pressure on pump # is greater than the user entered deviation limit.		Relieve system pressure.
P3F#	Devi-ation	Pressure High Inlet Pump #	The inlet pressure on pump # is greater than the user-entered deviation limit.		Decrease inlet pressure.
P4D#	Alarm	Pressure High Outlet Pump #	The outlet pressure on pump # is greater than the user entered alarm limit.		Relieve system pressure.
P4F#	Alarm	Pressure High Inlet Pump #	The inlet pressure on pump # is greater than the user-entered alarm limit.		Decrease inlet pressure.
P6D#	Alarm	Press. Sens. Removed Outlet #	No outlet pressure transducer is detected when the system is expecting one.	Disconnected transducer.	Verify transducer is connected properly. Replace if reconnecting does not eliminate the alarm.
P9D#	Alarm	Press. Sens. Failed Outlet #	Outlet pressure transducer has failed.	Outlet pressure transducer has failed or the pressure is above the readable range.	Relieve system pressure. Verify connections, or replace if reconnecting does not eliminate the alarm.

Code	Type	Description	Problem	Cause	Solution
P9F#	Alarm	Press. Sens. Failed Inlet #	Inlet pressure transducer has failed.	Inlet pressure transducer has failed or the pressure is above the readable range.	Relieve system pressure. Verify connections, or replace if reconnecting does not eliminate the alarm.
QADX	Alarm	Differential Pressure A Over B	Low differential pressure. This alarm is active only during Mix mode.	There is a leak on the B side.	Check the system for internal and external leaks on all catalyst manifolds and plumbing.
				The B side pump is cavitating.	Check paint supply on the B side, increase paint supply pressure.
QBDX	Alarm	Differential Pressure B Over A	High differential pressure. This alarm is active only during Mix mode.	There is a leak on the A side.	Check the system for internal and external leaks on all color manifolds and plumbing.
				The A side pump is cavitating.	Check paint supply on the A side, increase paint supply pressure.

System Errors

Code	Type	Description	Problem	Cause	Solution
EB00	Record	Stop Button Pressed	Record of a stop button press.	Indicates system stop key on ADM was pressed.	n/a
EC00	Record	Setup Value(s) Changed	Record of changing setup variables.	Indicates date and time when setup values were changed.	n/a
EL00	Record	System Power On	Record of power cycle (ON).	Indicates date and time when system was started.	n/a
EM00	Record	System Power Off	Record of power cycle (OFF).	Indicates date and time when system was turned off.	n/a
EMIX	Advisory	Pump Off	The pumps are not powered and are unable to move.	Pump power was turned off or an error occurred.	Start pumps by pressing pump start key on Advanced Display module.
ES00	Advisory	Factory Defaults	Record of defaults being loaded.		n/a

Communication Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. The unit's display will show the applicable number as the last digit in the code. For example, the CAC# code listed in this table will be displayed as CAC1 if the affected component is color change board 1, CAC2 for board 2, and so on.

Code	Type	Description	Problem	Cause	Solution
CA0X	Alarm	Comm. Error ADM	System does not detect the Advanced Display Module (ADM).	This communication error indicates that the Network has lost communication with the Advanced Display Module.	Check CAN cable connecting ADM to the EFCM.
CAC#	Alarm	Comm. Error Color Change #	System does not detect the Color Change Module #.	This communication error indicates that the network has lost communication with the Color Change Module #.	Check CAN cable connections to the Color Change Module # and any interconnected modules.
CADX	Alarm	Comm. Error Fluid Module	System does not see the Enhanced Fluid Control Module (EFCM).	This communication error indicates that the Network has lost communication with the EFCM.	Check CAN cables connecting ADM to the EFCM. Replace Cable or EFCM as necessary.

Code	Type	Description	Problem	Cause	Solution
CAGX	Alarm	Comm. Error Gateway	System does not detect a CGM that was registered as being connected at power up.		
CDC#	Alarm	Duplicate Color Change #	System detects two or more identical Color Change Modules.	More than one Color Change Module with the same address is connected in the system .	Check the system and remove the extra color change module.
CDDX	Alarm	Duplicate Fluid Module	System sees two or more identical Enhanced Fluid Control Modules EFCM).	More than one EFCM is connected in the system.	Check the system and remove the extra EFCM.

USB Errors

Code	Type	Description	Problem	Cause	Solution
EAUX	Advisory	USB Busy	USB drive is inserted, download is in progress.	Indicates USB port is uploading or downloading data.	Wait for USB Idle.
EBUX	Record	USB Drive Removed	USB drive was removed while downloading or uploading.	Downloading/uploading data on USB was interrupted by the USB device being removed.	Replace the USB device and begin process again.
EQU0	Advisory	USB Idle	USB download completed, drive may be removed.	Data transfer is completed to the USB device.	Remove USB device from ADM.
EQU1	Record	USB Sys. Settings Downloaded	Settings were downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
EQU2	Record	USB Sys. Settings Uploaded	Settings were uploaded from USB drive.	User installed USB device in ADM USB port.	n/a
EQU3	Record	USB Custom Lang. Downloaded	Custom language was downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
EQU4	Record	USB Custom Lang. Uploaded	Custom language was uploaded from USB drive.	User installed USB device in ADM USB port.	n/a
EQU5	Record	USB Logs Downloaded	Data logs were downloaded to USB drive.	User installed USB device in ADM USB port.	n/a
EVUX	Advisory	USB Disabled	USB drive has been inserted, downloading is disabled.	Configuration of system is blocking data transfer.	Change configuration to enable USB download function.
MMUX	Advisory	Maint. USB Logs Full	USB memory is more than 90% full.	Configuration parameter on system is enabled to generate this advisory.	Complete download to ensure no data is lost.
WSUX	Advisory	USB Config. Err.	USB configuration file does not match expected; checked on startup.	A software update was not completed successfully.	Reinstall software.
WXUD	Advisory	USB Download Err.	An error occurred while downloading to the USB drive.	User installed incompatible USB device in ADM USB port.	Repeat process with compatible USB device.
WXUU	Advisory	USB Upload Err.	An error occurred while uploading from the USB drive.	User installed incompatible USB device in ADM USB port.	Repeat process with compatible USB device.

Miscellaneous Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. The unit's display will show the applicable number as the last digit in the code. For example, the B9D# code listed in this table will be displayed as B9D1 if the affected component is pump 1, B9D2 for pump 2, and so on.

Code	Type	Description	Problem	Cause	Solution
B9A0	Advisory	Volume Rollover A Current	Batch counter for material A rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9AX	Advisory	Volume Rollover A Lifetime	Grand total counter for material A rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9B0	Advisory	Volume Rollover B Current	Batch counter for material B rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9BX	Advisory	Volume Rollover B Lifetime	Grand total counter for material B rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9D#	Advisory	Volume Rollover Pump #	Grand total counter for pump # rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9S0	Advisory	Volume Rollover Solvent Current	Batch counter for solvent rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
B9SX	Advisory	Volume Rollover Solvent Lifetime	Grand total counter for solvent rolled over.	The totalizer has reached maximum capable value and started over at zero.	n/a
WX00	Alarm	Software Errors	An unexpected software error has occurred.		Call Graco technical support.

Calibration Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. The unit's display will show the applicable number as the last digit in the code. For example, the ENT# code listed in this table will be displayed as ENT1 if the affected component is pump 1, ENT2 for pump 2, and so on.

Code	Type	Name	Description
END#	Record	Calibration Pump #	A calibration test was run on the pump.
ENS0	Record	Calibration Solvent Meter	A calibration test was run on the solvent meter.
ENT#	Record	Calibration Stall Test Pump #	A stall test was completed successfully on pump #.

Maintenance Errors

NOTE: In some error codes listed below, a # symbol is shown as the last digit. This symbol represents the applicable component number, which can vary. For example, the MAD# code listed in this table will be displayed as MAD1 if the affected component is pump 1, MAD2 for pump 2, and so on.

Because some components are assigned a 2–digit number, the last digit of the code is displayed as an alphanumeric character. The second table below correlates the alphanumeric digit to its component number. For example, code MEDZ represents outlet valve 30.

Code	Type	Name	Description
MAD#	Advisory	Maint. Outlet Pump #	Maintenance is due on pump.
MAT#	Advisory	Maint. Stall Test Pump #	Maintenance stall test is due on pump.
MEB#	Advisory	Maint. Valve Catalyst (B) #	Maintenance is due on catalyst valve.
MED#	Advisory	Maint. Valve Outlet #	Maintenance is due on outlet valve.
MEF#	Advisory	Maint. Valve Inlet #	Maintenance is due on inlet valve.
MEG#	Advisory	Maint. Valve Gun #	Maintenance is due on gun valve.
MES#	Advisory	Maint. Valve Solvent #	Maintenance is due on solvent valve.
MFF#	Advisory	Maint. Meter Flow #	Maintenance is due on flow meter.
MFS0	Advisory	Maint. Meter Solvent	Maintenance stall test is due on solvent meter.
MGH0	Advisory	Maint. Filter Fluid	Maintenance is due on fluid filter.
MGP0	Advisory	Maint. Filter Air	Maintenance is due on air filter.

Alphanumeric Last Digits

Alphanumeric Digit	Component Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

Alphanumeric Digit	Component Number
G	16
H	17
J	18
K	19
L	20
M	21
N	22
P	23
R	24
T	25
U	26
V	27
W	28
Y	29
Z	30

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

Flushing

- Flush before changing fluids, before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Cleaning the ADM

Use any alcohol-based household cleaner, such as glass cleaner, to clean the ADM.

Technical Data

Positive Displacement Proportioner	U.S.	Metric
Maximum fluid working pressure:		
MC0500 Systems with Low-Pressure Pumps	300 psi	2.1 MPa, 21 bar
MC0500 Systems with High-Pressure Pumps	1500 psi	10.5 MPa, 105 bar
MC1000 Air Spray Systems	300 psi	2.1 MPa, 21 bar
MC2000 Air-Assisted Spray Systems	1500 psi	10.5 MPa, 105 bar
Maximum working air pressure:	100 psi	0.7 MPa, 7.0 bar
Air supply:	85–100 psi	0.6–0.7 MPa, 6.0–7.0 bar)
Air filter inlet size:	3/8 npt(f)	
Air filtration for air logic (user-supplied):	5 micron (minimum) filtration required; clean and dry air	
Air filtration for atomizing air (user-supplied):	30 micron (minimum) filtration required; clean and dry air	
Mixing ratio range:	0.1:1 — 50:1, ±1%	
Fluids handled:	one or two component: • solvent and waterborne paints • polyurethanes • epoxies • acid catalyzed varnishes • moisture sensitive isocyanates	
Viscosity range of fluid:	20–5000 centipoise	
Fluid filtration (user-supplied):	100 mesh minimum	
Maximum fluid flow:	800 cc/minute (depending on material viscosity)	
Fluid outlet size:	1/4 npt(m)	
External power supply requirements:	90 - 250 Vac, 50/60 Hz, 7 amps maximum draw 15 amp maximum circuit breaker required 8 to 14 AWG power supply wire gauge	
Operating temperature range:	36 to 122°F	2 to 50°C
Storage temperature range:	–4 to 158°F	–20 to 70°C
Weight (approximate):	195 lb	88 kg
Sound data:	Less than 75 dB(A)	
Wetted parts:	17–4PH, 303, 304 SST, Tungsten carbide (with nickel binder), perfluoroelastomer; PTFE, PPS, UHMWPE	

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

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In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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For the latest information about Graco products, visit www.graco.com.

To place an order, contact your Graco Distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication.

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For patent information, see www.graco.com/patents.

Original Instructions. This manual contains English. MM 332562

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Revision B, January 2015